THE IRON TRADE REVIEW

Volume XLV CLEVELAND, SEPTEMBER 2, 1909 Number 10

FOREIGN ORE

BEING PURCHASED IN LARGELY INCREASED TONNAGES.

Uncertainty as to Ore and Coke Prices Makes Furnacemen Cautious About Quoting for Next Year's Delivery.

Great activity of furnaces and mills continues, and the only check being placed upon the rush of orders is due to conservatism of sellers, who regret the somewhat feverish tendency noticeable in some quarters. Furnace operators particularly are becoming cautious in regard to quoting for next years' delivery. Owing to the advancing quotations on coke and the uncertainty as to what ore prices will be next year, furnace interests are slow to make quotations, and when they do so, are naming considerably higher prices than have recently prevailed.

Coke Prices Advancing

Furnace operators who recently sent out inquiries for coke to meet their requirements for the first half of next year have been astonished by the high quotations received and have found that some important interests in the Connellsville region are unwilling to make any quotations at the present time. For the delivery named, $2.50 at the ovens now seems to be the minimum quotation for standard Connellsville furnace coke. Furnace men believe that this quotation is not justified and that the market will settle to a somewhat lower figure. They point to the fact that there are about 5,000 independent ovens and 2,000 Frick ovens idle, but the coke interests reply that it is impossible to employ enough laborers to put the idle ovens in operation, and it is uncertain when men can be obtained. They also hint that the Steel Corporation may continue to be a producer of coke. With coke at $2.50, the price of pig iron would be $17.50 on the usual seven to one basis, but no valley furnace has quoted more than $17 for first half delivery.

Buying Foreign Ores

The sale of 250,000 tons of Newfoundland ore for 1910 delivery to eastern furnaces adds another important transaction to the sales of foreign ore recently made to American companies. It is conservatively estimated that the total movement of ore next year from Cuba, Spain and Newfoundland will amount to more than 2,000,000 tons. Importations of Spanish and Swedish ores have already increased heavily, and ore from Russia and Greece will also be imported. In some cases in which the manganese content was high, Lake Superior interests have made price concessions to meet foreign competition. An important factor in the foreign trade is the uncertainty of ocean freight rates which usually advance rapidly as imports increase.

Pig Iron Activity

Sales of different grades of pig iron in the Pittsburg district during the past week amounted to fully 30,000 tons. An important factor of the week has been the heavy buying of basic in the Philadelphia district, where about 25,000 tons were contracted for and 15,000 tons in the central west. Steel companies in the Philadelphia district have been endeavoring to buy basic in the Pittsburg district, while melters in the central west have mailed inquiries long distances in the hope of getting basic required for the remainder of this year. In eastern territory, the minimum on basic is now $18, delivered. Southern furnaces are taking a limited tonnage of first quarter delivery at $14 for No. 2 foundry, Birmingham.

Duplex Process

The increasing scarcity of heavy melting steel scrap suitable for open-hearth use is having the effect of popularizing the duplex process in the east. The Steelton experiments in that direction, noted some months ago, have proved so successful that practically the entire steel output there is now made in this way. It also develops that the open-hearth furnaces building at Sparrows Point will also operate on hot metal coming direct from the Bessemer converter.

Furnace Operations

Furnace activities are gradually increasing. Incomplete returns show that the August pig iron output of the Steel Corporation was about 1,090,000 tons, breaking by over 60,000 tons the previous record set in July. Operations of the Corporation are now at about 93 per cent of capacity. The Thomas Iron Co. has blown in three stacks during the last two weeks. A year ago, it was running only one of its 10, but it now has only one small stack idle. Only five or six additional stacks in eastern Pennsylvania remain to be blown in. The Cleveland Furnace Co. will blow in its new stack Sept. 15. It is now positively announced that the Buffalo Union Furnace Co., a Hanna interest, will build two new blast furnaces on its Niagara river site, and will immediately equip one of its present stacks with pig casting machinery for making basic iron.

STRIKE PRACTICALLY ENDED.

(Special Telegram.)

Youngstown, O., Sept. 1.—The Youngstown Sheet & Tube Co. has had remarkable success in inaugurating the open shop policy at its sheet mills. All of its six mills are in operation with an efficient force of men. While the strike has not been formally declared off, it is practically ended.

THE WEEK IN IRON CENTERS

PITTSBURG.

General Activity Continues—Sharp Advance in Coke Prices.

Office of THE IRON TRADE REVIEW,
510 Park Building, Aug. 31.

Great activity continues to prevail in practically every branch of the iron and steel industry, and in some products the mills are so overwhelmed with tonnage that deliveries are falling farther and farther behind. In conservative circles, the question is being raised whether the industry is not recovering too rapidly to insure a sustained stability and moderation is being counselled. The attitude of the railroads continues encouraging, however, while the country at large appears to be absorbing all the tonnage it can get and is crying for more, as stocks are being replenished and consumption is on the rise.

There is an unprecedented demand for steel bars and current orders being entered are larger than the outputs of the mills, so that definite promises of shipments are becoming out of the question. Makers have not been prepared for such a rush of business in this line, which is attributed to recent advances in manufacturing and building operations, and already one hears of tentative plans for relieving overtaxed mill capacities by extensions of plants. In sheets and tin plate, the situation is fitly illustrated by the case of the American Sheet & Tin Plate Co., which entered in August 25,000 tons more business than during any similar month in its history. The rolling schedules of the plate and shape mills are the most satisfactory since the active days of 1907.

The coke market, after lagging since trade began to revive several months ago, has struck a sharp advancing gait and prices are considerably higher. With the increased blast furnace activities, shipments of some coke companies have jumped fully 75 per cent since May. The main cause for the upward movement in this market is, however, ascribed to the shortage of labor in the operating regions, where more than 7,000 ovens or about 20 per cent of the total capacity in the Connellsville territory, are still in idleness. Pig iron is very active in the Pittsburg district and consumers are covering for periods into the new year. Prices are on the rise. Scrap is scarce and the mills are consuming greater tonnages of pig iron to avoid the necessity of coming into the market.

Iron Ore.—A widespread interest in Mesabi Bessemer ore is being shown and a number of large interests have entered the market for about 100,000 tons to fill out their requirements over the current year. They are meeting with scant encouragement, however, as many companies are sold up on this grade, while old range Bessemer is even harder to get.

Pig Iron.—A heavy buying movement in pig iron, notably in the foundry grades, by consumers in this territory for extended future shipment, is in progress. Sales of different grades in the week in the Pittsburg district aggregate upwards of 30,000 tons. The softness in foundry iron, which has been occasioned by the aggressiveness of some furnaces in seeking tonnage, is disappearing.

A development arising from the sold-up condition of the eastern market, has been the heavy inquiry by Philadelphia consumers for basic iron from the valley. Between 10,000 and 15,000 tons of this iron for the remainder of the year was called for from local sellers in the week. Quotations of $15.85 valley, or $18.50 delivered Philadelphia, were made on some of these lots and one sale of 5,000 tons for September and October shipment was closed on a basis of about $15.75 at furnace in this district, but not in the valleys. Other transactions in steel-making iron include 4,000 tons of prompt Bessemer to the Youngstown Sheet & Tube Co., at $16.50 valley, which is in addition to the 15,000 tons sold to the same interest as reported last week; 5,000 tons of Bessemer for delivery up to November to a furnace interest to apply upon its own contracts at $16.75 valley, and 1,000 tons of prompt Bessemer to the same buyer at $16.50 valley; 1,500 tons of Bessemer for first half to a local steel foundry at $17 valley, and 5,000 tons of prompt basic at $15.50 valley. A western melter is in the market for 5,000 tons of basic for prompt shipment.

There is a general movement among foundry iron consumers to cover for last quarter and first half requirements. One Pittsburg interest bought about 5,000 tons of No. 2 at $15.75 for this year and from $16.25 to $16.50 valley for first half. Another took 2,500 tons of No. 2 for first half at $16.25 valley. One interest which has been active in selling under the general market took about 9,000 tons in the week, but is now understood to have advanced its price. It is reported that $16 valley has been shaded recently on some first half business.

Inquiries from local melters include one for 2,000 tons of No. 2 and 1,000 tons of Bessemer for delivery from November to July for a machinery builder, and another for 1,000 tons of No. 2 for first half by a railway appliance company. Some low-phosphorus iron has just been sold in this territory at $20.50 delivered Pittsburg.

The Clinton and Kittanning furnaces have blown in on foundry and basic respectively. The Cherry Valley stack is about to be put on malleable.

On prompt and for shipment over the remainder of the year, we quote on northern iron as follows:

Bessemer, valley	$16.50 to 16.75
Bessemer, Pittsburg	17.40 to 17.65
No. 2 foundry, Pittsburg	16.65 to 16.90
Gray forge, Pittsburg	15.25 to 15.65
Basic, valley	15.50 to 15.75
Basic, Pittsburg	16.40 to 16.65

Ferro-Alloys.—Prices of ferro-manganese are gradually hardening, although some instances of recent low selling are still reported. Sales of spot material were made this week at $42.50 Baltimore. A local consumer took 150 tons for first half at about $44 Baltimore. There has been other moderate buying by local interests. The 50 per cent ferro-silicon market is firm at about $65 Pittsburg. There is some low selling by domestic makers in the lower grades of ferro-silicon.

We quote ferro-manganese at from $42 to $43, Baltimore, prompt shipment, or for delivery this year and the first half of 1910, $44 to $45, Baltimore. The freight from Baltimore to Pittsburg is $1.95.

Fifty per cent ferro-silicon is quoted at $65 to $66, Pittsburg; domestic, 12 per cent, $25; 11 per cent, $24; 10 per cent, $23, Pittsburg.

Plates.—Contracts for three new freighters have been placed by Cleveland parties with lake ship building works, and these will require 15,000 tons or more of plates and shapes which will come from Pittsburg mills. The Ann Arbor railroad has awarded 500 freight cars to the Standard Steel Car Co., which will be built at its Hammond, Ind., shops, and the steel required will be furnished by the Illinois Steel Co. The mills are having more favorable rolling schedules than at any time since the active market of 1907. Many small miscellaneous orders are being entered. Boiler steel is however still moving slowly and little large pipe work is appear-

ing. The Pressed Steel Car Co. is operating on a small basis, but during the week specified more freely against contracts. Prices are firm at the quoted figures. We quote the present market as follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.40c to 1.45c, mill. Extras are as follows, per 100 pounds; Boiler and flange steel plate, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches, up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edge, 0.10c; under 3/16 to and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—In a number of respects, the sheet market is reflecting a greatly increased consumption by the different branches of trade which are users of this product. The August tonnage entered by the American Sheet & Tin Plate Co. exceeds that of any August in the company's history by about 25,000 tons, and most of this gain is credited to sheets. Jobbers are now showing activity in replenishing their stocks and the heaviest specifications in two years are being filed by car roofing companies, indicating the activity in box car building. Some independent companies which have booked a heavy business have been quoting for some weeks advances of $1 a ton over the minimum prices. The leading interest has also been making some changes in the grading and quotations on its blue annealed product. The company this week is running 143 mills or 80 per cent. The independent companies have active about 90 per cent of their total capacity. We quote present minimum prices as follows:

Blue annealed sheets, Nos. 3 to 8, 1.60c; Nos. 9 to 10, 1.65c; Nos. 11 and 12, 1.70c; Nos. 13 and 14, 1.75c; Nos. 15 and 16, 1.85c; box annealed sheets, Nos. 10 to 12, 1.85c; Nos. 13 and 14, 1.90c; Nos. 15 and 16, 1.95c; Nos. 17 to 21, 2c; Nos. 22 to 24, 2.05c; Nos. 25 and 26, 2.10c; No. 27, 2.15c; No. 28, 2.20c; No. 29, 2.25c; No. 30, 2.35c; galvanized sheets, Nos. 13 and 14, 2.25c; Nos. 15 and 16, 2.40c; Nos. 17 to 21, 2.50c; Nos. 22 to 24, 2.65c; Nos. 25 and 26, 2.85c; No. 27, 3.05c; No. 28, 3.25c; No. 29, 3.40c; No. 30, 3.65c; painted roofing sheets, $1.55 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $2.80 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—The plants of makers of tin plate are being operated more actively at present than they have been in the corresponding season for several years. The largest maker is establishing new tonnage records and the independents are booked practically full for some time ahead. One large consumer has recently encountered difficulty in obtaining desired deliveries on a contract for 70,000 boxes, as some manufacturers are unable to promise shipment in less than from eight to 10 weeks on either black plate or the coated product. There is still nothing definite as to next year's prices, although some independents for future shipment are asking from $3 to $5 a ton over the $3.40 per box price. The operations of the independents are at about 90 per cent of capacity and those of the American Sheet & Tin Plate Co. are 141 mills or 63 per cent of serviceable equipment. We quote the present market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.40 to $3.65 f. o. b. mill, Pittsburg district. Terms 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material. — The Missouri Pacific railroad has entered the market for about 40,000 tons of standard rails for next year's delivery, and this contract is expected to be closed with the mills within the next several weeks. Several other large railroad systems which obtain their rail requirements from the Pittsburg district have seriously taken up the matter of tonnage for next year's delivery. Estimates are being compiled and negotiations for reservations are under way, so that the placing of definite orders is expected soon. There is some buying of rails from local mills by western users who have been unable to obtain deliveries from the mills of that territory. The additional freight from Pittsburg is netting increased cost of $2 to the buyer on such deliveries. The local maker last week took a number of small orders of 1,000 tons and less and entered 1,700 tons of light rails. Track fastenings are very active. Spikes are firm at the advanced prices. We quote the market on Bessemer rails as follows, the base price for open-hearth rails being $30, mill.

Fifty-pound and heavier, 500-ton and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 8-pound, $31; 12-pound, $30; 16 to 25-pound, $29; 30 to 35-pound, $28.75; 40 to 45-pound, $28; angle splice bars for standard sections, 1.50c, Pittsburg; standard spikes, 1.70c to 1.75c, Pittsburg; hand spikes, 1.75c to 1.85c, Pittsburg.

Steel.—There is little relief to be noted for consumers in the tightly-held condition of merchant steel. Some of the large makers continue reluctant to quote prices at all, and others quoting will accept little business at their own figures. Sheet bars have been sold as high as $26.50, Pittsburg, and forging billets at $30, Pittsburg. Small Bessemer billets are held at $26 mill. Open-hearth billets are hard to get and prices are indefinite. The consumption of steel by the merchant buyers is heavy and specifications against contracts are very full. It has not been learned that any foreign steel has yet been imported under the revised duty.

Bessemer 4 x 4 billets with 0.25 carbon and less are regularly quoted at $25 to $26, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets from $26.50 to $27.50, Pittsburg. Forging billets are held at $28 to $30, Pittsburg. Sheet and tin bars are quoted at $26.50 to $27, Pittsburg.

Hoops and Bands.—The 1.50c Pittsburg price on hoops now appears to be quite firmly established as the market's minimum. New buying and specifying against contracts are both more active and the mills are getting a larger run of tonnage than for months. Some concessions have been made in this market, but these seem to have completely disappeared. We quote the market as follows:

Hoops in carload lots, 1.50c; in less than carload lots, 1.60c; bands, 1.35c, base half extras as per standard steel.

Merchant Bars.—The tonnage being entered on the books of leading steel bar makers is larger than the current production of the mills, and deliveries are gradually becoming more extended. These now run from six to eight weeks, or even more in some sizes. The present demand is quite overtaxing the capacity of the mills, and already tentative plans are being considered for increasing bar mill equipments. The market is very firm at the minimum of 1.35c, Pittsburg, and some makers report business being taken at higher figures. Bar iron is

steady at 1.50c, Pittsburg, with a better demand in evidence. Shafting is moving freely. Prices are regular. We quote the present market as follows:

Common iron bars, 1.50c to 1.55c, Pittsburg; Bessemer and open-hearth steel bars, 1.35c to 1.40c; plow and cultivator, 1.35c to 1.40c; channels, angles, zees, tees, under 3-inch, 1.45c; all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 60 per cent in carloads and 55 per cent in less than carloads, delivered in base territory. Planished and machine straightened tire is 1.55c base; iron finished tire under 1½ by 1½ inches, 1.50c, both plus ½ extra on tire card; iron finished tire, 1½ x ½ and over, 1.35c, plus ½ extra on the steel bar card.

On cold rolled strip steel, width 1½ inches and wider, and 0.100 inch and thicker, we quote base prices for 100 pounds, $3.05 on hard, and $3.30 on soft.

Structural Material. — The accumulation of tonnage of various shapes for single rollings is the most satisfactory in several years, and the mills are turning out some heavy outputs. There is an especially large number of miscellaneous building projects involving small single tonnages before the market. The delivery of plain material continues an important factor in fabricated work. Prices are steady at a minimum of 1.40c, Pittsburg, and in some cases 1.45c has been done. The American Bridge Co. has closed for 1,800 tons for the new shops of the Wheeling & Lake Erie railroad, which will be erected at Brewster, Pa. The American Bridge Co. has also taken 10 additional steel barges for river traffic for the American Steel & Wire Co. The lot will contain about 600 tons of structural material. The McClintic-Marshall Construction Co. will furnish 500 to 600 tons for the new office building of the Standard Oil Co. in this city. The Jones & Laughlin Steel Co. has taken an award of 100 tons of sheet steel piling for cofferdam construction in Canada by the Michigan Central railroad. We quote the market on structural shapes as follows:

Beams and channels, 15-inch and under, 1.40c to 1.45c; over 15 inches, 1.50c to 1.55c; zees, 1.40c to 1.45c; tees, 1.40c to 1.45c; angles from 3 to 6 inches, 1.40c to 1.45c; over 6 inches, 1.50c to 1.55c; universal and sheared plates, 6¼ inches wide and wider, 1.40c to 1.45c.

Merchant Pipe.—Strength is apparent in the tubular situation. The mills are booked heavily for nearby shipment and are exercising caution in accepting orders which involve shipments over any extended period. The jobbers have been ordering freely for the full consumption of merchant pipe which is now beginning. The inquiry is out in this market for 15 miles of 6¼ to 6⅝-inch steel casing for western shipment. We quote the following official discounts on merchant pipe subject to an additional one point and five off to jobbers:

	—Steel— Black.	Galv.	—Iron— Black.	Galv.
⅛ and ¼ inch.....	72	56	67	..
⅜ inch	73	59	68	54
½ inch	76	64	71	59
¾ to 6 inch	80	70	75	65
7 to 12 inch	75	60	70	53
PLUGGED AND REAMED.				
1 to 4 inch	78	68	73	63
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch.....	65	53	60	48
½ to 4 inch.....	72	60	57	55
4½ to 8 inch.....	68	56	63	51
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inch.....	61	50	56	45

Boiler Tubes.—Though there are some instances of better buying, the boiler tube market is still dull, particularly as to the merchant trade. The boiler building trade is still quiet. Prices are not firm. We quote the following official discounts on lap-welded steel boiler tubes to jobbers in carloads:

1 to 1½ inch	50
1¾ to 2¼ inch	62
2½ inch	64
2¾ to 5 inch	70
6 to 13 inch	62

2¼ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

We quote the following official discounts on charcoal iron tubes to jobbers:

1 to 1½ inch	45
1¾ to 2¼ inch	45
2½ inch	50
2¾ to 5 inch	57
6 to 13 inch	45

Wire Products.—The jobbers of wire and nails in this territory are still ordering quietly, but greater activity is anticipated soon, as prospects for the fall trade are excellent. Some of the jobbers are now well stocked at former lower prices and 90-day contracts at 1.70c, which expire Sept. 1, have been fully specified. The manufacturing trade is doing very well and is ordering consistently. Prices are firm and we quote as follows:

Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, with 30c for galvanizing; plain wire to jobbers in carloads, $1.60, and to retailers in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.10.

Wire Rods.—Little new business is being booked in rods and we quote the market nominally at $31 Pittsburg on Bessemer and $32 Pittsburg on open hearth rods.

Coke.—An inadequate supply of labor in the Connellsville and adjacent operating regions which is holding production stationary together with an increasing demand continues to advance coke prices to higher levels. At the present time, there are out of blast about 5,000 independent ovens or approximately 35 per cent of the total independent ovens in the Connellsville region, in addition to about 2,000 ovens of the United States Steel Corporation which are also idle. Some of these plants would resume under present conditions, but the labor is not available. During the past three months, shipments of some companies have increased as much as 75 per cent owing to greater blast furnace consumption. There has also been a recent absorption of the floating supply in the regions by the United States Steel Corporation and other interests. These forces have combined to bring about the present flurry in coke prices. At the present time, spot furnace coke is quoted at from $1.90 to $2 ovens, and for the rest of the year at $2 ovens and upward. Tonnages for spot shipment were closed this week at $2 ovens. A number of furnaces are in the market for requirements over the remainder of this year, and the first half of 1910. Flat prices on first half shipment have been made in only a few cases, as makers are backward to quote. A large Mahoning valley interest has contracted for 40,000 tons monthly of furnace coke for first half at about $2.35 ovens. A contract for 5,000 tons monthly for 16 months from date was made at $2.25 ovens. There has been some selling of West Virginia coke for first half at $2.10 ovens. Foundry coke prices range from $2.10 to $2.25 ovens on prompt, and from $2.25 to $2.50 ovens on contract. One large producer, effective Sept. 1, raised its price on spot foundry coke to $2.35 ovens and is asking $2.65 ovens on first half contracts. The *Courier's* figures for the week ending Aug. 21 show 30,962 ovens active with an output of 397,979 tons, compared with 30,829 active ovens and a production of 395,188 tons the previous week.

Old Material.—The scrap market is suffering from a shortage of freely-

offered material and prices are buoyant. Not a great tonnage of scrap is finding its way to the open market, and considerable of this limited supply is being picked up by dealers and held for speculation. The amount in dealers' hands is however, not believed to be excessive. Many of the large steel companies are staying out of the market by using their own production of scrap with a larger percentage of pig iron in their mixtures. At the prices at which finished products have been selling, these users represent they cannot afford to buy at the present market. Low phosphorus scrap continues in demand and is not easy to obtain. Several steel foundries in this district have been in the market for from 7,000 to 10,000 tons and have bought several thousand tons at about $21, delivered. Buyers of borings have been offering up to $10.50. We quote gross tons delivered in the Pittsburg district as follows:

Heavy melting scrap, $16.50 to $17; re-rolling rails, $17 to $17.50; bundled sheet scrap, $15 to $15.50; iron axles, $25 to $26; old iron rails, $18.50 to $19; No 1 wrought scrap, $17 to $17.50; old car wheels, $16.25 to $16.75; low phosphorus, $20 to $21; machine shop turnings, $12.25 to $12.75; cast borings, $10.50 to $10.75; No. 1 cast scrap, $15 to $16; malleable, $15.25 to $15.75; stove plate, $12 to $12.50.

CINCINNATI.

Southern Iron Market Firm and Prices Tending Upward.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Aug. 31.

Pig Iron.—A strong tone prevails and southern iron for delivery over the remainder of this year is quotable at $13.50 for No. 2 Birmingham. Transactions in southern iron for the remainder of the year have been small, as consumers are apparently well covered with contracts and the furnaces have sufficient orders on the books to make them independent, especially as the first quarter of next year is on a higher price basis than now prevails. There is considerable inquiry for first quarter and first half of next year and southern furnaces are taking a limited tonnage for first quarter delivery at $14.00, Birmingham. There has been enough business taken at this price practically to establish this figure as a quotation, but southern producers are not authorizing their agents to solicit business freely and the sales that have been made have been the result of firm offers and acceptances. A large tonnage of southern Ohio foundry iron has been sold within the past 10 days throughout this territory for first quarter and first half of next year's delivery on the basis of $15.50 for No. 2 at furnace. This has resulted in an advance of 50c per ton, and the market is now $16.00 for first half of next year in southern Ohio, with one stack which has been a conspicuous seller withdrawn from the market and believed to be practically sold up. The accumulations at the furnaces are gradually being reduced, but in some instances it appears that buyers have taken iron on contracts faster than they have been able to melt it, and stocks in consumers' yards in this territory are rather large. In confirmation of this belief, some low priced iron is being held up and instances are cited where consumers have paid for the iron and taken a storage certificate from the furnace owing to the inability to put the tonnage on their own yards. The principal inquiry in the market a week ago from a Michigan melter for 7,000 tons of foundry and 2,000 tons of southern silvery has been closed, but the sales were not reported as made through this market. We quote for prompt delivery, and for the rest of this year, delivered Cincinnati, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton as follows:

Southern foundry No. 1	$ 17.25
Southern foundry No. 2	16.75
Southern foundry No. 3	16.25
Southern foundry No. 4	15.75
Southern No. 1 soft	17.25
Southern No. 2 soft	16.75
Southern gray forge	14.75 to 15.25
Northern No. 1 foundry	17.20
Northern No. 2 foundry	16.70
Northern No. 3 foundry	16.20
Jackson county 6 per cent silicon	18.70
Jackson county 8 per cent silicon	19.70
Jackson county 10 per cent silicon	20.70

Finished Material.—The market continues firm for all descriptions. There is but little doing in the way of new business but specifications on contracts are large and have been heavier during the past week than at any time since the depression. Hence mills are getting further behind with deliveries. The tendency of prices is upward and some interests are asking an advance over previous quotations on bands and spikes. Sales in this market are usually based on Pittsburg quotations.

Coke.—The market is showing more strength and in the Connellsville district for this year's delivery ranges from $2.00 to $2.35 while furnace coke on contracts for first half of next year is quoted all the way from $2.10 to $2.50. Wise county foundry coke for this year's delivery is quotable from $2.00 to $2.25 at the ovens and furnace coke on contracts from $1.67 to $1.75 to the ovens. Pocahontas foundry coke is quoted from $2.00 to $2.25 and furnace coke for last half delivery at $1.85 to $2.00 at the ovens.

Old Material.—There is more irregularity as to prices but the market is firm and some quotations are higher. There is evidently a strong undertone to the market, and while trade is rather quiet holders are maintaining prices well. We quote dealers prices here as follows:

Old No. 1 R. R. wrought net tons	$14.50 to 15.00
No. 1 machinery, net tons	13.50 to 14.00
Old iron rails, gross tons	15.00 to 16.00
Old steel rails (re-rolling) gross tons	14.00 to 14.50
Old short lengths, gross tons	13.50 to 14.00
Old iron axles, net tons	17.00 to 17.50
Heavy melting scrap, gross tons	15.00 to 15.50
Stove plate, net tons	10.50 to 11.00
Heavy turnings, net	9.50 to 10.00
Cast borings, net tons	8.00 to 8.50
Car wheels	14.50 to 15.50

The Union Furnace at Ironton, O., owned by Rogers-Brown & Co., which has been practically rebuilt, will be blown in about Oct. 1 on basic iron. The furnace will be operated actively making basic, malleable and bessemer as the market demands.

PHILADELPHIA.

Basic Purchased from Furnace in the Pittsburg District.

Aug. 31.

Pig Iron.—There has been further selling of basic during the week, chiefly for delivery during the early months of next year, the aggregate tonnage involved being at least 25,000. This was made up of several moderate blocks, ranging from 6,000 tons down, and was placed by a number of melters with at least five producers. As a result of this buying and that recently reported, one of the largest interests in this territory has its requirements for the ensuing 12 months well covered. Other consumers, however, are by no means so comfortably situated and an important tonnage is now under negotiation for first quarter and first half delivery, with furnaces by no means anxious to take on further contracts for that period. With two or three eastern steel works, which are running much more heavily than anticipated, the scarcity of prompt basic has become a very serious problem, and in one case a considerable block was purchased during the week from a furnace in the Pittsburg district; the melter took all that was offered, but this was only about one-third of the tonnage desired. Several thousand tons of Virginia basic were

placed in this territory during the week, the price bring $18.00, delivered, which is now the minimum on eastern Pennsylvania product as well. One Virginia interest, however, has advanced to $18.50, and some local makers are tending toward that level. There has been some additional selling of low phosphorus iron at $20.75, eastern Pennsylvania delivery, but quotations continue rather ragged. Foundry irons continue in good demand, and the minimum on No. 2X delivered, is now $17.50 with most producers holding at from 50 to 75 cents higher. Several small lots have been sold for shipment over the first quarter, and this movement is increasing. Several pipe manufacturers are in urgent need of iron and a few sales are reported at advancing prices, as this metal continues extremely scarce. It is now figured that in this territory eight stacks,—with two exceptions small—will probably become operative before Jan. 1; that will represent the maximum production for the district and from all indications will blow in without changing the situation materially. We quote, delivery at eastern Pennsylvania plants over the remainder of the year, as follows:

No. 1X foundry	$18.00 to 18.50
No. 2X foundry	17.50 to 18.00
No. 2 plain	17.00 to 17.50
Standard gray forge	16.50 to 17.00
Basic	18.00 to 18.50
Low phosphorus	20.50 to 21.00
No. 2 Birmingham	17.00 to 17.50
No. 2X Virginia	18.00 to 18.50
No. 2 plain Virginia	17.50 to 18.00

Finished Materials.—The market presents no new features, but there is a steady run of business which is keeping steel works in this district operating at full capacity. Cramps have not yet covered their plate and shape requirements for the recently awarded battleship. The Pennsylvania has an inquiry out for a good tonnage of miscellaneous steel supplies needed for the Altoona shops, where a large number of cars are under construction. The Baldwin Locomotive Works continue to report good bookings, among the latest being 15 locomotives for the St. Louis & San Francisco, 14 for the Alabama Great Southern, and 10 for the Illinois Central, besides about 10 scattering. A general upward tendency on finished steel is noted, but the general price level is still as follows: Structural shapes, 1.60c; plates, 1.55c to 1.60c; steel bars, 1.50c to 1.55c; refined bar iron, 1.45c to 1.50c.

Old Materials.—No important developments are reported and prices show little change, the combination buyer reporting ample supplies available at $17.00 delivered. Some purchases, however, are reported as high as $17.50. We quote, gross tons, eastern Pennsylvania delivery, as follows:

Old steel rails (rerolling)	$18.25 to 18.75
No. 1 steel scrap	17.25 to 17.75
Old steel axles	22.50 to 23.00
Old iron axles	24.50 to 25.00
Old iron rails	20.00 to 21.00
Old car wheels	16.00 to 16.50
Choice scrap R. R. No. 1. wrought.	19.50 to 20.00
No. 1 yard scrap	18.00 to 18.50
Machinery scrap	15.75 to 16.25
Low phosphorus scrap	20.50 to 21.00
Wrought iron pipe	16.50 to 17.00
No. 1 forge fire scrap	15.50 to 16.00
No. 2 forge fire scrap, ordinary	9.50 to 10.00
Wrought turnings	14.00 to 14.50
Axle turnings, heavy	14.00 to 15.00
Cast borings	12.00 to 12.50
Stove plate	14.00 to 14.50

BUFFALO.

Pig Iron Quiet—Strong Demand for Finished Materials.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Aug. 31.

Pig Iron.—The demand upon local furnaces for iron from consumers in this territory is very light at the present time owing to lack of business in the foundries and other iron consuming industries. It is generally believed that this territory from the consumer's standpoint is less active than any other commercial field in the country at the present time. The output of furnaces is, however, moving out freely and substantial inquiries are coming in, but it should be observed that the call for good tonnage is coming, in a large measure, from other commercial centers and in some cases from distant points. Quotations for last quarter or prompt delivery are unchanged this week, but for deliveries during first quarter of 1910, the quotations are about 50 cents higher. There is an advance in quotations for first quarter iron although the actual selling for the new price is light as yet. A fair estimate of inquiries appearing in this market the past week would be about 20,000 tons, but this total represents numerous inquiries for small tonnage. Prices of southern iron at this point are stiffening and high silicon is delivered in Buffalo for $21.85. This is for Jackson county, O., iron and prices include the remainder of 1909. For the first half of 1910, an advance of 50 cents on prompt prices is quoted. We quote on northern iron, f. o. b. Buffalo, as follows:

No. 1X foundry	$16.25 to 16.75
No. 2X foundry	15.75 to 16.25
No. 2 plain	15.25 to 15.75
No. 3X foundry	15.00 to 15.25
Malleable Bessemer	15.50 to 16.00
Gray forge	15.00 to 15.25
Charcoal	19.50 to 20.50

Finished Products.—The tone of the finished material market shows increased strength and the general conditions of the trade are tightening up with quite a strong tendency toward advanced prices in most lines. Several interests are now asking 1.40c Pittsburg on bars and 1.45c on structural plates and shapes. This is another advance of 5 cents on plates and shapes and it would not be surprising to see bars make another slight advance within the next few weeks. Fabricators find it difficult to get the smaller sizes of plates and shapes for delivery during the rest of the year at any price. Some of the mill interests are now covered for four months or until Jan. 1, and judging from the number of specifications appearing at this point, the market is inclined to gain in strength. Rivets have also advanced in price. Structural rivets are now quoted 1.80c f. o. b. Pittsburg, and boiler rivets 1.90c by the independent interests. In this territory there are signs of some substantial business in finished products. The Niagara Machine & Tool Works has purchased a site upon which a large plant may be built. The Buffalo Structural Steel Co. has been awarded the general contract for building the Casey Grand Hotel, a Scranton, Pa., project. The construction will require 750 tons of structural steel which will be furnished by the Lackawanna Steel Co. The fabricating will be done at the plant of the Buffalo Structural Steel Co.

ST. LOUIS.

Pig Iron Sales Not Numerous, but Market is Strong.

Aug. 30.

Pig Iron.—With the exception of a sale last week of 9,000 tons of northern and southern iron, including 1,800 tons of southern gray, another sale of about 2,000 tons of malleable, and still another of 2,000 tons of southern and eastern iron, the disposals of iron in the St. Louis territory were limited to car loads and 200-ton lots. The market is stiffening, however; small orders are coming in, and dealers are looking forward to better times than have prevailed for many months. Inquiries are out for deliveries over the remainder of the year, also covering the first quarter and half of next year. Prices are firm at $13.50 to $14, Birmingham basis, for No. 2, and as high as $14.50 is reported to have been paid in orders to get quick shipments on favorite brands. Some No. 2 was bought last week as low as $13, but this is believed to have been re-sale

iron, and does not reflect the status of the market.

The Tennessee Coal, Iron & Railroad Co. has opened its books for the first quarter after a withdrawal from the market for at least two months, and while it has made no sales and avers that it is not anxious for business, inquiries have been submitted to Birmingham covering about 1,500 tons for deliveries over the first quarter of 1910. Several other large interests are understood to be in the market. The furnaces express themselves as well satisfied with the way specifications are coming in on contracts and insist that stocks are gradually being reduced. Ohio iron is strong at $15.50 for shipment over the remainder of the year; $15.75 for first quarter delivery and $16 for shipment over the second quarter. Ohio furnaces are reported to have been booking orders rapidly, and their withdrawal from the market for still higher prices will not cause surprise in the St. Louis territory.

Our quotations for southern iron, delivered, to which the freight of $3.75 from Birmingham has been added, follow:

No. 1 southern	$17.25 to 17.75
No. 2 southern	16.75 to 17.25
No. 3 southern	16.25 to 16.75
No. 4 southern	15.75 to 16.00

Coke.—Quotations on coke are stiffening, some of the operators having withdrawn prices, and others promulgated an advance of from 15 to 25 cents a ton for delivery over the rest of the year. The best 72-hour Connellsville foundry coke is commanding a price of from $2.25 to $2.50, ovens, for this year's delivery, and from $2.50 to $2.75 for shipments next year, with the market rapidly getting stronger. Connellsville 48-hour furnace coke is offered at from $1.70 to $1.90, and Virginia 48-hour furnace grades at $1.80, ovens. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis. By-product coke is bringing $5.10, f. o. b., St. Louis.

Finished Material.—Dealers in the St. Louis territory insist that the outlook for structural material is better than it has been for a long time. The basis for this belief is that the small dealers in the country are sending in orders, and the railroads are beginning to buy. Contracts were let last week to an Indianapolis firm for the 1 000 tons of steel to be used in the construction of additions to the new city hospital, and another contract was let to a St. Louis firm for about 1,100 tons of steel and about 240 tons of cast iron to be used in the new municipal court building.

Old Material.—The demand for scrap iron is light, but the market is stiffening very decidedly. Our quotations are as follows:

Cast iron borings, free from foreign material, net tons	$ 5.50 to 6.25
Steel axle turnings, gross tons	11.00 to 12.00
Steel railroad axles, net tons	18.00 to 19.00
Iron railroad axles, net tons	20.00 to 21.00
Miscellaneous steel scrap, gross tons	11.00 to 12.00
Old car wheels, gross tons	15.50 to 16.50
No. 1 railroad cast scrap, net tons	12.50 to 13.50
Heavy machinery cast, net tons	14.00 to 14.25
Stove plate and light cast, net tons	10.00 to 11.00
Sheet iron, net tons, uncut	5.00 to 5.50
No. 1 railroad wrought, net tons	13.00 to 13.50
Railroad malleable net tons	13.00 to 13.50
Heavy melting steel, net tons	12.00 to 13.00
Relaying rails, net tons	18.00 to 19.00
Extra heavy cast, regular breaking	12.00 to 13.00
Railroad grate bars (eng)	10.50 to 11.00

CLEVELAND.

Eastern Furnaces Reduce Purchases of Lake Superior Ores.

Office of THE IRON TRADE REVIEW,
Browning Building, Aug. 31.

Iron Ore.—As the buying of Lake Superior ore for the season ending next May has about ended, it is interesting to note that the purchases by eastern furnaces are considerably smaller than the average of recent years. This is due partly to the large use of Cuban ores by the two steel companies which control the Cuban deposits, and is also due in part to the fact that Spanish, Russian and other foreign ores can be purchased at lower prices than are asked for the Lake Superior ores. In some cases in which the manganese content was high, price concessions have been made by lake interests to meet foreign competition. The extent to which the eastern furnaces will continue to buy foreign ores is problematical, owing to the uncertainty of ocean freight rates and other conditions.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer $4.00; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—Inquiry for pig iron for the remainder of this year is not quite so active, but buyers are inquiring freely for delivery during the first half of next year. On an inquiry for 5,000 tons of basic for the remainder of this year, to be shipped to a distant point, several interests have declined to quote, and the general attitude of the furnaces at this time is one of cautiousness. As coke prices are advancing and as it is expected that ore prices will be higher by May 1, furnace men are very uncertain as to what it will cost to manufacture iron, and hence, are slow in making quotations. Cleveland furnaces have advanced for next year's delivery to $17 at the furnace for No. 2. We note the sale of 300 tons of No. 2 foundry at $17, Cleveland furnace, the first quarter of next year. For this year's delivery $16.50 Cleveland is the usual quotation. For prompt shipment, we quote delivered in Cleveland as follows:

No. 1 foundry	$17.00 to 17.25
No. 2 foundry	16.50 to 17.00
No. 3 foundry	16.25 to 16.50
No. 2 southern	17.85
Gray forge	15.00 to 15.50
Bessemer	17.40 to 17.65
Lake Superior charcoal	19.50 to 20.00
Jackson Co. 8 per cent silvery	20.05

Coke.—There is considerable excitement in the coke market Inquiries sent out by several furnaces for their requirements for the first half of next year have failed to develop anything below $2.50 for high grade Connellsville foundry coke, although as low as $2 can be done on inferior grades. The quotations for first half coke are considered too high by at least 25 cents by the furnace men, who are expressing the belief that the market can not be maintained at the high quotations now being made. A number of important coke companies have declined to quote for next year's delivery. We quote spot furnace coke at from $1.85 to $2 and first class Connellsville foundry coke $2 to $2.25 on prompt and $2.25 to $2.50 on contract for the remainder of the year

Finished Materials.—Mills seem to be falling gradually farther behind in deliveries, and in some cases, especially small rounds, there is loud complaint on behalf of the consumers. Deliveries are running about as follows at present: Beams and channels, seven to nine weeks; large rounds and squares, four to five weeks; small rounds and squares, from six weeks to twelve weeks; blue annealed sheets, five to eight weeks; galvanized sheets, four to five weeks; heavy plates, four to five weeks. The 152-inch plate mill of the Otis Steel Co. in now in operation. Jobbers are advancing their quotations generally $1 on bars and shapes, and $2 to $3 on sheets. The bar iron market shows some improvement.

Old Material.—The market continues strong with no apparent signs of any weakening in the near future. There is a strong demand for cast iron, probably due to a scarcity of pig, and it is predicted that there will be a decided jump in the price of old

castings. We quote f. o. b. Cleveland, as follows:

Old iron rails	$18.00 to 18.50
Old steel rails (re-rolling)	16.00 to 16.50
Old steel rails (under 6 feet)	15.50 to 16.00
Old car wheels	15.50 to 16.00
Old steel boiler plate	13.50 to 14.00
Malleable iron (railroad)	16.00 to 16.50
Steel axles	19.00 to 19.50
Malleable iron (agricultural)	14.00 to 14.50
Heavy steel	15.25 to 15.75
Country mixed steel	14.00 to 14.50
Low phosphorus	18.00 to 18.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.00 to 15.50
No. 1 busheling	13.25 to 13.75
No. 1 machine cast	13.50 to 14.00
Iron axles	19.50 to 20.50
Axle turnings	11.50 to 12.00
Machine shop turnings	10.00 to 10.50
Grate bars	12.00 to 12.50
Pipes and flues	12.00 to 12.50
Tank iron	11.50 to 12.00
Hoop and band iron	9.50 to 10.00
Sheet iron	8.00 to 8.50
Wrought drilling	10.00 to 10.50
Stove plate	11.50 to 12.00
Cast borings	8.00 to 8.50

CHICAGO.

Strong Demand for Pig Iron and All Finished Products.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Aug. 31.

In the entire field of iron and steel manufacture, in this district, there is not the slightest sign of weak spots, and, almost without exception, the various lines of industry are crowded in a very uncomfortable manner with business which is taxing their capacity and their ingenuity to clear off their books. Furnace capacity is well employed, and yet local stocks are reported to be diminishing, while selling of pig iron continues unabated, and at prices which reflect an upward tendency, rather than any movement in the other direction. Sellers are not charging higher prices simply because they can get them, but the constantly increasing demand is being made the lever by means of which prices logically advance. Great activity continues in finished and semi-finished materials. Some 30,000 tons of standard section rails were sold during the week covered by this report, and the business in light rails, which has not been encouraging for some time, shows good improvement. Sales of fabricated material in this market reached a total of 18,000 tons for the week, and other districts are said to have done even better. Some of the manufacturers of boilers and machinery have not as yet felt the full force of the tide of prosperity which is rising so unmistakably in other lines, but this has a very reasonable and easily understood explanation. It is a matter of common experience that these lines do not get busy until some time after other lines are actively employed, but their activity is still marked, after others who have felt the pressure earlier, are complaining of dull times. In the so-called panic of 1907, many manufacturers did not lose money, although they made none, and when the present wave of good times swept along, they found themselves in a position to take advantage of it, for, not having lost money, they had employed the time of slackness, and a portion of their capital or reserve, in making improvements to their plants, putting in new boilers, etc., so that their ability to handle business which came their way is greater than ever. That a very satisfactory business will come to the boiler makers, and soon, scarcely can be doubted.

Pig Iron.—More evidence of backbone is observable in the Chicago pig iron market this week, and quite a heavy volume of business is reported. Considerable Hanging Rock iron was sold here, probably amounting to 10,000 tons, and possibly at some concession in price. It is understood, however, that this cleans up all the offerings from that region, and that those furnaces have withdrawn from the market. Southern irons are being held firmly at $14, Birmingham, for first quarter of next year, and some selling is being done on that basis, although sales are not being pressed. While some iron is being disposed of, for this year's delivery, at $13.50, it is pretty certain that the foundries have covered their requirements for the remainder of 1909, although the general improvement in business may make it evident that the larger melt consequent upon the improved conditions, will take more iron than has been purchased, and this will lead to additional buying and may have the effect of stiffening prices for near-by delivery. Both gray iron and malleable foundries are very busy, and are experiencing difficulty in securing labor; this is particularly true of the malleable foundries, where metal is poured almost continuously for a good portion of the day, and workmen have drifted into other channels that offer more desirable employment during the summer months. Inquiries for iron in 500 to 2,000-ton lots, are very numerous, and it is reported that all interests are buying. Prices are firmly maintained, one important agency standing squarely on the position it has taken, of $18.50, Chicago, for No. 2 northern foundry. The Grand Crossing Tack Co., Chicago, is in the market with an inquiry for 5,000 tons of basic iron for delivery over the remaining months of the year, and some furnaces have declined to make any quotations. We quote as follows:

Lake Superior charcoal	$19.50 to 20.00
Northern foundry No. 1	18.50 to 19.00
Northern foundry No. 2	18.00 to 18.50
Northern foundry No. 3	17.50 to 18.00
Southern foundry No. 1	18.35 to 18.85
Southern foundry No. 2	17.85 to 18.35
Southern foundry No. 3	17.10 to 17.60
Southern foundry No. 4	16.60 to 17.10
Southern No. 1 soft	18.35 to 18.85
Southern No. 2 soft	17.85 to 18.35
Southern silveries, 4 per cent silicon	18.35 to 18.85
Southern silveries, 5 per cent silicon	18.85 to 19.35
Southern silveries, 6 per cent silicon	19.85 to 20.85
Jackson Co. silveries, 6 per cent.	20.40
Jackson Co. silveries, 8 per cent.	21.40
Jackson Co. silveries, 10 per cent	22.40
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.00 to 19.50
Alabama basic	18.35 to 18.85

The conditions surrounding this market are practically the same as for some weeks. The two producers in this territory are sold up, and any supply of steel for the market would have to come from Pittsburg or other producing center, and the cost at Chicago would be cost of the material at point of origin, plus freight.

Merchant Bars.—The demand for bar iron and steel continues very active, and at an increasing rate. While there is some talk of business done at the top figures in our quotations, and even above, it can be safely said that those quotations represent the general run of transactions. There is no question of the firmness of prices. Car building seems to go on without abatement; orders for the 1,000 narrow gage freight cars for the Illinois Tunnel Co., mentioned in these columns Aug. 19, will be placed at once; the same company will also buy 50 electric locomotives; the Great Northern road is in the market for 500 to 1,000 ore cars and the St. Louis & San Francisco for gondolas. We quote for Chicago delivery, as follows:

Bar iron, 1.45c to 1.50c; hard steel 1.45c to 1.50c; soft steel bars and bands, 1.53c to 1.58c, half extras, soft steel angles, less than 3 x 3, 1.63c to 1.68c, half extras; hoops, 1.63c to 1.68c base, full extras; planished or smooth finished tire steel, 1.63c to 1.68c; iron finish, up to 1½ x ½ inch, 1.63c, base, tire card; iron finish, 1½ x ½-inch and larger, 1.43c to 1.48c base, steel card; channel for solid rubber tires, ¾ to 1 inch, 1.93c to 1.98c; and 1⅛ inch and larger, 1.83c to 1.88c; smooth finished machinery steel, 1.73c; flat sleigh shoe, 1.53c; toe calk steel, 2.03c; spring steel, 2.08c; crucible spring steel, 2.58c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 60 per cent off the list for carload lots, and 55 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.70c to 1.80c, base, full extras; soft steel bars, 1.70c to 1.80c per 100 pounds

tons of standard rails, to a number of base, plus half extras; soft steel hoops, 2.25c, full extras.

Structural Material.—This has been a week of continued heavy booking, and orders are coming in at a rate that exceeds the capacity of the plants. The tonnage of fabricated material booked in this market during the past week was 18,000 tons, over half of which is to be used in new construction work in Chicago. The contract for the steel for the Harris Trust Co. building was taken by the American Bridge Co.; it amounted to 5,610 tons. The Brooks Estate building, 2,100 tons, went to the Brown-Ketcham Iron Works, Indianapolis; the Jelke butterine manufacturing building, 1,300 tons, was secured by A. Bolter & Sons, Chicago; the Kranz building, 213 tons, went to the Southwestern Architectural Iron Works, Chicago. All the foregoing buildings are to be erected in Chicago. The contract for the Woodruff building, Joliet, Ill., 450 tons, went to the Decatur (Ill.) Bridge Co.; and that company also secured the contract for the People's Bank building, Bloomington, Ill., 376 tons; the Old Lost River irrigation projects, in Idaho, taking 70 tons, will be furnished by the Central States Bridge Co., Indianapolis, Ind.; the Omaha Bee building, 291 tons, went to the Paxton-Vierling Co., Omaha, Neb.; the Minneapolis Steel & Machinery Co. secured the contract for the Old National Bank building, 2,764 tons, at Spokane, Wash.; the American Bridge Co. booked the steel for the Wyoming building at Denver, and for the St. Louis River Bridge Co.'s work at Duluth, 4,500 tons. The Chicago office of the American Bridge Co. reports that the other offices of the company are doing relatively even better than the Chicago office. Store prices have advanced $1.00 per ton. We quote mill prices for structural shapes, Chicago delivery as follows:

Beams and channels, 15-inch and under, 1.63c to 1.68c. For extras see Pitttsburg report.

Local store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $1.85 per 100 pounds; angles over 6 inches, $1.95 per 100 pounds base; 3 to 15 inches, inclusive, $1.85 per 100 pounds base; channels 3 inches and larger, $1.85 per 100 pounds base.

Rails and Track Supplies.—Both standard section and light rails have commanded considerable attention this week, the latter, which have been in rather slight demand for some time, showing a marked improvement. The leading interest here sold about 30,000 roads, in miscellaneous lots, the largest amount taken by one road being 12,000 tons. Prices on track bolts have been advanced within the week.

See Pittsburg report for prices on standard sections. On light rails, Chicago delivery, we quote as follows:

Light rails, 40 and 45-pound, $26; 30 and 35-pound, $26.75; 16, 20 and 25-pound $27; 12-pound, $28. In lots of 250 to 500 tons a reduction of 60 cents a ton from these prices is made; lots of 500 tons and up carry a reduction of $1 a ton. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.75c to 1.85c; smaller size spikes, 1.85c to 1.95c base; track bolts, with square nuts, 2.25c to 2.35c; with hexagon nuts, 2.40c to 2.50c.

Plates. — There has been a heavy demand for plates, according to reports of manufacturers, this week, which is a continuation of conditions which have existed for several weeks. Makers are booking orders at a rate in excess of their ability to take care of them promptly in their mills. An advance in store prices was made, on Tuesday, of $1.00 per ton. We quote, for Chicago delivery as follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.58c to 1.63c. For extras see Pittsburg report. Store quotations are without change, as follows:

Tank steel, ¼-inch and heavier up to 72 inches wide, 1.85c to 1.95c; from 72 inches wide to 96 inches wide, 1.95c to 2.05c; 3/16-inch up to and including 60 inches wide, 1.95c to 2.05c; 72 inches, 2.20c to 2.30c; No. 8 up to 60 inches wide, 2c to 2.10c. Flange and head quality, 25c extra.

Cast Iron Pipe.—The small-lot character of demand still marks this line, there being a good inquiry from the southwest. Prices are unchanged, as follows: Four-inch water pipe, $27.50; 6 to 14 inches, $26.50; larger sizes, $25.50; gas pipe, $1 a ton higher.

Old Material. — Quite a little buying, in a quiet way, has taken place the past week, according to information from reliable sources, and prices are being well maintained, and, in some cases, making slight advances. The Chicago, Burlington & Quincy R. R. sold a list of scrap, the past week, at very good prices. The entire list amounted to about 2,500 tons, about 800 tons of which was Nos. 1 and 2 railroad wrought, in nearly equal parts; the price obtained for the No. 1 was, $15.15. The material was taken locally. An important interest is said to have been buying up country scrap, to reduce its average price of scrap previously bought.

The Chicago, Rock Island & Pacific Railway Co. sold about 2,800 tons of miscellaneous scrap today (Tuesday), most of which went to Chicago interests. There were 400 tons of No. 1 R. R. wrought, and 300 tons of No. 2, which brought $15.35 and $14.15, respectively. Lesser quantities of No. 1 cast, and mal eable scrap, sold for $14.55 tnd $14.80, respectively. We quote:

Old car wheels	16.25 to 16.50
Old iron rails	18.75 to 19.00
Rerolling rails (4 ft. and over)	16.50 to 16.75
Old steel rails (2 ft. and under)	16.25 to 16.50
Light section relayers, 45 lbs. and under subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	22.50 to 23.50
Frogs, switches and guards	15.00 to 15.50
Heavy melting steel	15.00 to 15.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.00 to 15.25
No. 2 R. R. wrought	14.00 to 14.25
Arch bars and transoms	17.75 to 18.00
Knucklers, couplers and springs	14.25 to 14.50
Shafting	16.50 to 17.00
Iron car axles	20.00 to 20.25
Steel car axles	19.00 to 19.25
Locomotive tires	15.50 to 15.75
Dealers' forge	12.50 to 12.75
Pipes and flues	11.00 to 11.25
No. 1 cast 150 lbs. and less	14.25 to 14.50
No. 1 busheling	12.50 to 13.00
No. 2 busheling	9.00 to 9.25
No. 1 boiler cut	10.75 to 11.25
Boiler punchings	13.75 to 14.00
Cast and mixed borings	6.50 to 6.75
Machine shop turnings	9.00 to 9.25
Railroad malleable	14.25 to 14.75
Agricultural malleable	11.50 to 12.00
Stove plate and light-cast scrap	12.00 to 12.25
Angle bars, splices, etc. (iron)	16.50 to 17.00

NEW YORK.

Heavy Ore Imports—Good Demand for Pig Iron and Prices Firm.

Iron Ore.—The feature of the week has been the sale of 250,000 tons of Wabana (Newfoundland) ore for 1910 delivery, details of which are given in another column. It is significant of the general trend of furnace conditions in the east that in the case of both Spanish and Newfoundland ores, the only foreign product offered so far for next year's delivery, purchases have been decidedly heavier than for the current year. One of the two steel interests operating Cuban mines expects to bring in fu ly 1,000,000 tons during 1910, which would require the importation of only 350,000 tons by the other to give a total movement during the year of 2,000,000 tons from Cuba, Spain and Newfoundland alone. In addition, some ore is always brought in from Sweden, Canada, Russia and Greece. There is a possibility of a further tonnage being available from both Newfoundland and Spain, and the Cuban tonnage will doubtless run well over the figures given, so that it now seems safe to predict a total import movement of considerably more than 2,000,000 tons. In 1907, with one exception the most

active year for importations of ore on record, the total was 1,229,168 tons.

Pig Iron.—Developments of the past week have included brisk selling of foundry, pipe and basic irons, the blowing in of considerable additional capacity in the eastern Pennsylvania district and substantial advances in certain selling centers, notably Buffalo, which for some time have been the weakest spots in the situation. Buffalo furnaces have taken on some attractive business at a $16 basis for 1910 shipment, and are now holding for $16.25, insisting that the former figure is the best that can be done even on early delivery iron. There is a very active movement of their iron for barge shipment, which commands a $1.50 freight rate to Sound points, as canal operations will be suspended for the winter some time in October; for barge lots the price is 15 cents higher. A New England melter has just closed for a total of 5,500 tons for first half delivery; of this, 1,000 tons was high phosphorus, 2,000 tons low silicon, and 2,500 tons high silicon. It is understood that the General Electric inquiry, 8,000 tons for its Schenectady works, has also been placed, this being for delivery over the remainder of the year. Aside from this, we note one sale of an important tonnage of pipe iron and numerous transactions ranging from 1,000-ton lots downward. There is still a brisk call for basic, both prompt and future delivery, and the inquiry now current is very heavy. An advance on the Virginia product has put it out of the running temporarily, and no further relief for eastern steel interests can be expected from the Pittsburg district for the same reason. The Thomas Iron Co., which a year ago was operating but one of its ten stacks, is now running nine, having blown in three during the past two weeks. Heavy sales of basic are reported from the central west. We quote, delivery at New York tidewater over the remainder of the year, as follows:

Northern foundry No. 1	$18.24 to 18.75
No. 2X foundry	17.75 to 18.25
No. 2 plain	17.25 to 17.75
No. 2 southern foundry	17.50 to 18.00
Malleable	18.00 to 18.50
Gray forge	16.25 to 16.75

Ferro-Alloys.—Prompt ferro-manganese is still available at $42, seaboard, this being the general quotation at present, although one interest is understood to be shading this figure. For first quarter, the current price seems to be $44, seaboard, at which level we note sales aggregating over 2,500 tons. For first half $45 is the figure usually mentioned. A 200-ton inquiry for ferro-silicon is still pending; the fact that there are considerable stocks, landed before the tariff advance, is holding the price down, and either imported or domestic material can be had at $65 to $66, Pittsburg.

Cast Iron Pipe.—Aside from two small sales reported by the United States Cast Iron Pipe & Foundry Co., one of 300 tons to a Springfield gas lighting interest and another of 650 tons to the Malden & Melrose Gas Lighting Co., Boston, no important activity is noted, though prices are growing better.

Finished Materials.—Structural lettings for the month have been relatively light, as few important lettings have been announced with the exception of the Westchester bridge order, taken by the American Bridge Co., which will probably call for as much as 30,000 tons of steel, although the tonnage involved for the present is only about 20,000. The Pennsylvania Steel Co. will probably furnish about 1,250 tons for the Twenty-second Regiment armory and the Bethlehem Steel Co. is reported low on 1,000 tons for the Reciprocity mills at South Boston. Some decision is expected tomorrow on a large tonnage of bridge work required for the canal through Cape Cod, bids close this week on about 3,000 tons for the court house and post office at New Orleans, about 1,200 tons is pending for the Houston Terminal Railroad, and several smaller bridge contracts are under negotiation. Fabricating prices continue to show improvement. A 600-ton beam contract has been placed by the American Woolen Co. with an independent interest.

There is a brisk demand for billets, but practically all makers are sold up so fully that they are unable to take on further business. The Pennsylvania Steel Co. noted the recent sale of 10,000 tons of slabs and another lot of 500 tons. A lot of about 600 tons of steel pipe has been sold by the leading export interest for shipment to Honolulu. We quote:

Angles, 3 to 6 inches x ¼-inch and heavier 1.56c to 1.61c; beams 3 to 15 inches, 1.56c to 1.61c; tees, 3 x ¼-inch and heavier, 1.56c to 1.61c; plates, carloads, tank, 1.56c to 1.61c; marine boiler, 1.86c; bar iron, 1.45c to 1.50c; soft steel bars, 1.51c to 1.56c; sheets, No. 28, black 2.56c.

Old Materials.—The local market is quiet and rather featureless, no important sales being reported and prices remaining at about the same level. There is considerable interest in the Isthmian scrap letting early in September. It develops that this tonnage is for delivery over a long period and because of its mixed character will probably have to be taken by a concern with a yard, as much of it will have to be cut up and sorted. As it is chiefly made up of foreign material, it will be subject to an import duty. We quote, New York prices, gross tons, as follows:

Old steel rails (rerolling)	$15.00 to 15.50
Relaying rails	19.00 to 19.50
Old car wheels	14.50 to 15.00
Old iron car axles	22.00 to 23.00
Old steel car axles	20.00 to 20.50
Heavy melting steel	14.50 to 15.00
No. 1 railroad wrought	16.50 to 17.00
Iron track scrap	14.50 to 15.00
Wrought pipe	14.00 to 14.50
Cast borings	9.50 to 10.00
Wrought turnings	11.00 to 11.50
Heavy cast scrap	13.00 to 13.50
Railroad malleable	13.00 to 13.50
Stove plate	11.50 to 12.00
Grate bars	11.00 to 11.50

BRITISH IRON MARKET.

Pig Iron Improves—Sheet Market is Demoralized.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, England, Aug. 21.

Further improvement in the pig iron industry has to be registered this week. This is more apparent in the Midlands than in Middlesborough where there has been some fluctuation through the action of speculators. These gentlemen have rushed their iron into the market, to realize profits, and so have brought down general prices. Stocks also in that district continue to increase, the quantity in store being now 271,905 tons. The Cleveland price a few day ago ran up to 50s 6d ($12.36) then fell to 50s 1½d ($12.27), and yesterday's quotation was 50s 11½d ($12.47). Yesterday's sales amounted to 20,000 tons. There is a slight improvement in exports, which up to the present are 62,090 tons compared with 53,826 last month. In the Midland district, the improvement is very marked, selling prices being one shilling more than they were a week ago with plenty of orders. Northamptons now range from 46s 6d ($11.38) to 47s 6d ($11.50). The hematite trade shows marked improvement owing to better steel demands, and mixed numbers on the east coast are on offer at 55s 6d ($13.70). But in Barrow in Furness, improvement is not quite satisfactory, and the 26 furnaces in operation are quite equal to every requirement.

Finished Materials.—An effort is at last being made to obtain more money for finished iron. The improved demand for shipbuilding is bringing orders for rivet iron and cable iron into the district. The weak department is

that of sheets, where competition seems to have become quite reckless. While more orders are received, consumers can get material practically at their own price. It is clear also that continental competition will be more than ever a factor in the future, not only because of additional plants being provided, but also because Belgian makers have a decided advantage over British houses in the matter of freight. The sheet department is likely to be disorganized for some time to come, greatly to the advantage of the merchant and consumer, who have now fairly got the upper hand, and mean to use their advantages to the fullest extent. In other branches, price agreements are being found practically impossible.

METAL MARKETS.

ST. LOUIS.

Aug. 30.

Lead and Zinc.—The demand for lead and zinc ores slackened in the Missouri-Kansas-Oklahoma district last week, with 60 per cent zinc ore bringing $50 a ton, base, and $52.50 for extra choice lots. Lead brought a high price of $58 a ton, a decline of $2 from the top price of the preceding week. Offerings were few at $50, and from that the price ranged down to $47. The record price of the year $54.50 a ton, was paid for zinc ore sold during preceding week, and loaded out last week. This also was the highest price paid since January, 1906. Large bins from outlying camps were obtained, as a result of the buying being more evenly distributed over the territory than usual.

Operators are doing their utmost to increase the output of the district, with the result that smelters are getting all the ore they demand. Based on present developments, the weekly output of the district can be increased 1,000 within the next year.

There was a slightly weaker demand for calamine, the average base price being from $25 to $26 a ton. St. Louis spelter also showed a decline, being quoted at $5.65. St. Louis pig lead was quoted Saturday at $4.25.

NEW YORK.

Aug. 31.

Copper.—The market is only fairly active, as consumers recently have shown a disposition to allow their stocks to run down. Consumption is gradually increasing and is now not far from a point equal to production. One estimate places August sales at about 75,000 pounds. Current selling is on the basis of 13⅛c to 13¼c for Lake, 12⅞c to 13⅛c for electrolytic and 12¾c to 12⅞c for casting. On the New York Metal Exchange standard copper was quoted as follows at today's call:

Spot	12.60 to 12.75
September	12.60 to 12.75
October	12.65 to 12.85
November	12.70 to 12.90
December	12.75 to 12.95

Pig Tin.—There has been a rather sharp advance in prices, accompanied by moderate buying, though the movement at no time has been an important one. Current selling is on the basis of 30½c to 30¾c, a small lot selling on the metal exchange today at 30⅝c.

Pig Lead.—Little activity is noted and there is no change in the situation, current quotations being 4.35c to 4.40c for fairly prompt delivery.

Spelter.—The market has assumed a position in which neither producers nor consumers are particularly anxious for heavy transactions, and the market is nominal at 5.65c to 5.75c for early shipment.

Antimony.—We quote Cookson's 8⅝c; Hallett's 8¼c to 8⅜c; other brands 7½c to 7¾c.

CHICAGO.

Aug. 31.

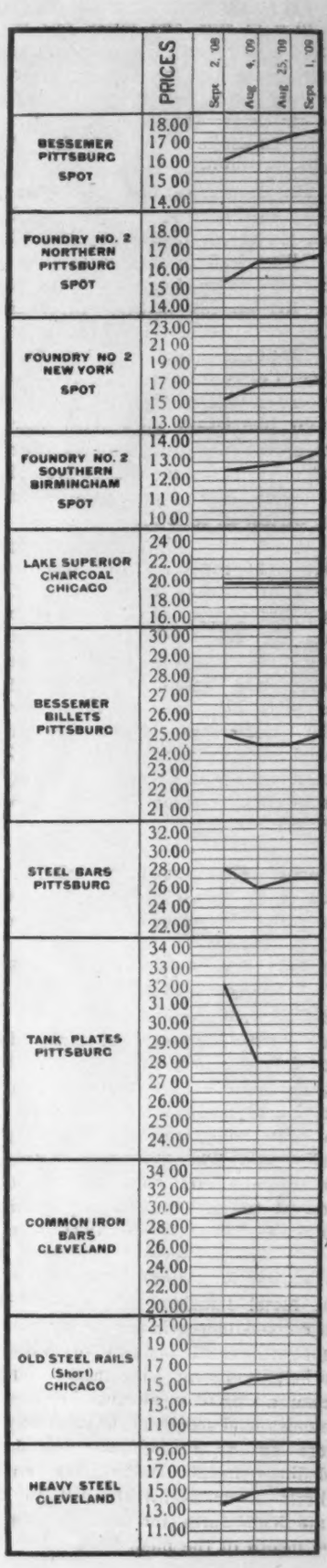
Sheets.—A very heavy demand is reported in this line, and this is especially true in reference to store stocks, where the situation is described by the word "swamped." One leading house reports that its deliveries out of store, which are supposed to be immediate, are, at this writing, set for Sept. 8, which means that "immediate deliveries" are lagging behind at least a week. Prices quoted below are for immediate acceptance, as an advance is expected in a day or two.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents. We quote store prices at Chicago as follows:

No. 10, 2.10c to 2.20c; No. 12, 2.15c to 2.25c; No. 14, 2.20c to 2.30c; No. 16, 2.30c to 2.40c; Nos. 18-20, 2.50c to 2.60c; Nos. 22-24, 2.55c to 2.65c; No. 25, 2.60c to 2.70c; No. 27, 2.65c to 2.75c; No. 28, 2.75c to 2.85c; No. 30, 3.05c; galvanized sheets, Nos. 10 to 16, 2.90c to 3c; Nos. 18 and 20, 3.05c to 3.15c; Nos. 22 to 24, 3.20c to 3.30c; No. 25, 3.40c to 3.50c; No. 27, 3.60c to 3.70c; No. 28, 3.80c to 3.90c; No. 30, 4.20c to 4.30c.

New Metals.—This has been a fairly active week in the metal market. A lot of consumers of copper have been holding off, in the hope of seeing lower prices; if these should start

PRICE CHART.



to buy at about the same time, there would be quite an advance; their requirements will force them into the market before long. Spelter is higher, as also is tin; the latter has been forced up by quite a prolonged "bull" campaign in London; a reaction from the high prices which have ruled in the tin market for some time is expected to set in at an early day. We quote as follows:

Lake copper, carload lots, 13⅝c to 13¾c; casting copper, 13¼c; smaller lots, ¼c to ¾c higher. Spelter, 5.80c to 5.85c; lead, desilverized, 4.45c to 4.50c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $7.50 list f. o. b. LaSalle in car lots of 600-pound casks; pig tin, 32c to 32½c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

Old Metals.—A very quiet market has been the history of the past week, and prices show no change from last quotations. We quote dealers' selling prices, as follows:

Copper wire, 13¼c; heavy copper, 13c; light copper, 11½c; heavy red brass, 12c; heavy yellow brass, 9½c; light brass, 6¾c; No. 1 red brass borings, 10c; No. 1 yellow brass borings, 7¾c; brass clippings, 9½c; tea lead, 3.60c; lead scrap, 4c; zinc, 4½c; tin pipe, 29c; tin foil, 27c; pewter, 20c; electrotype plates, free from wood, 4¼c; electrotype dross, 2.75c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $70 per ton.

British Coal and Iron.—Official figures from Great Britain show that the production of coal in 1908 amounted to 261,528,795 tons, which was 6,057,071 less than the year before. The production of iron ore was 15,031,025 tons against 15,731,604 the year before. Imports of manganiferous ore amounted to 6,057,051 in 1908 against 7,641,934 in 1907. The production of manganese ore in 1908 fell to 6,308 tons from 16,098 the preceding year. The production of dressed tin ore was 8,008 tons. The production of tin ore has steadily declined since 1884, when it was 15,117 tons.

Charles R. Atherton, secretary of the Metal Polishers' and Buffers' International union, in his report to the executive board of that organization during its recent Cincinnati meeting, declared that 63 per cent of the deaths among metal polishers during the year were due to tuberculosis caused by inhaling metal dust from emery wheels. The board decided to ask state legislatures for laws to protect the health of the men.

MORE OPEN-HEARTHS.

Will Be Built by Eastern Steel Co.—Other Improvements.

(Special Telegram.)

New York, Sept. 1.—The Eastern Steel Co., Pottsville, Pa., will shortly begin the construction of two additional open-hearth furnaces and the installation of improved facilities in its yards for cutting and shipping structural material. Plans are now being prepared and the work will be rushed as rapidly as possible. At present, there are four open-hearth furnaces at this plant; hence these improvements will constitute a heavy addition to its capacity.

ALLIS-CHALMERS CO. MAY ENLARGE FOUNDRY CAPACITY.

Milwaukee, Wis., Aug. 30.—"We are considering the proposition of increasing our foundry capacity either at the Cincinnati works or at West Allis," said L. F. Bower, vice president of Allis-Chalmers Co., Milwaukee, today to a representative of THE IRON TRADE REVIEW when asked concerning reports circulated in the press for some time that large additions would be made at the Milwaukee works.

"It is almost positive that we will enlarge our foundry at Cincinnati, but the matter of the reported additions to the Milwaukee foundry has not been definitely decided upon. It is true that plans are being made but the time for the enlargement has not been decided upon. Recent reports published by papers in Milwaukee and elsewhere are greatly exaggerated and entirely without fact. The tone of business is very good and the prospects are very bright."

NORTHERN PACIFIC ORDERS CARS.

(Special Telegram.)

Seattle, Wash., Sept. 1.—The Northern Pacific has ordered 200 freight cars from the Seattle Car Mfg. Co. The cars are to be built at once at the Renton shops of the car company, near Seattle.

Crane Sales.—It is reported that the Morgan Engineering Co. has made a sale of 24 standard cranes to the American Locomotive Co. The majority will be delivered to the Dunkirk plant. The Morgan company has an order for two four-girder ladle cranes, one electric stripper and three smaller cranes from the United Steel Co., Canton, O.

NEW STACK IN.

Eastern Pennsylvania Plants Are Resuming Operating.

Reading, Pa., Aug. 31.—The iron industry in this section has a little more than held its own during the month of August, one new furnace of the Berkshire Iron Co., at Sheridan having been blown in, while none went out of blast. Another furnace at Pottstown will be blown in in September and there are to be increased activities in the iron industry at Leesport.

The work of getting the Keystone and Emaus furnaces ready to resume operations is progressing rapidly. It is expected that both will be in readiness to start by Oct. 1. Numerous improvements will be made at these plants and the capacity increased. All the mills at Coatesville are now in full operation, and nearly 300 carloads of raw material are loaded daily.

The Reading Iron Co. this week paid out in semi-monthly wages the largest amount in two years. It is likely that a new works will be erected near the Oley street mill of the Reading company.

Purchased from Receiver. — The Waynesburg Pa. forge, sheet and tin mills have been purchased at receiver's sale by Waynesburg capitalists, and it is probable that the plant which has been idle for five years will again be operated. The rolling equipment consists of two hot sheet mills and four hot black plate mills and a sheet bar mill. The works were built in 1900.

The Allis-Chalmers Co. has entered the field as a manufacturer of machinery for sand-lime brick and has already completed arrangements for adding this line to its extensive output. Franklin Henshaw, an engineer of wide experience in this line and formerly associated with the International Sand-Lime Brick Co. of New York City, has been employed by the company as commercial engineer to take charge of the work.

The twelfth annual session of the American Mining Congress has been called to meet at Goldfield, Nevada, Sept. 27. The sessions will continue until Oct. 2. The proposed national bureau of mines, the mining laws, mining accidents, fraudulent promotion of mines, the smelting trust, and other subjects will be considered.

LAKE SUPERIOR MINING INSTITUTE

Members Enjoy a Few Days of Travel and Discussion on Oldest Iron Range.

The oldest of the northern iron ranges was the gathering place for the fourteenth annual meeting of the Lake Superior Mining Institute, and at Ishpeming, only a few miles from where ore was first discovered, some 250 members gathered on the morning of Aug. 25. The operations of the Marquette range being, in general, well known to the members of the institute, the program for the meeting was planned to cover in the matter of inspection trips, particularly the new undertakings of the past few years. Of these, the district being newly developed by the Cleveland-Cliffs Iron Co., at Gwinn, the same company's new Maas mine, the Gayley dry blast installation at the charcoal iron furnace of the Pioneer Iron Co., and the new plant of the Lake Shore Engine Works, at Marquette, were included in the program's itinerary. Further than this the trip was laid out in the nature of a pleasant outing for the members wherein the splendid beauty of some of the northern scenery was offered for a few days' enjoyment.

Negaunee Visited.

In a special train the party was taken Wednesday morning from the headquarters at the Nelson house to the Maas mine, at Negaunee. This mine is of interest, not only because of its splendid equipment, but because of the great difficulty and expense of sinking the shaft. It was the experience with this shaft which led the Cleveland-Cliffs Iron Co. to the adoption of a concrete shaft. This property is one of the new and recently equipped mines of the Cleveland-Cliffs Iron Co., but the sinking of the shaft was so difficult that work on it had already been begun in August, of 1903, when the institute last visited the Marquette range. From the depth of 167 feet, whiich had been reached at that time, the shaft has now been put down to a depth of 1,136 feet. The building of the present surface equipment was begun in 1906 and completed in 1908. Modern buildings of brick construction have been erected and the following machinery was installed: The boiler plant consists of three 350-horsepower water tube boilers, equipped with mechanical stokers, induced draft and economizers. The ore hoist is a first motion Corliss, 20 inches by 48 inches, and operates two skips in balance at an average speed of 2,000 feet per minute. The compressor is a Corliss compound condensing two-stage machine with air cylinders 24 inches by 40 inches and steam cylinders 24 inches by 46 inches, with a stroke of 48 inches and a capacity of 5,000 cubic feet per minute at 60 revolutions. Air is furnished for the Negaunee mine from here, also. Electric haulage is installed in the mine, the power for which is developed by a 100-kilowatt generator driven by a tandem compound high speed engine, operated condensing. Six and one-half ton locomotives are used underground on 30-inch gage 40-pound rails.

The lay of the ground around the Maas shaft is especially well adapted to the requirements of surface operations, and full advantage of this has been taken in the layout of the buildings and trackage. The well-known policy of this company with regard to beautifying its mining location is also much in evidence, and the mine location presents a very attractive appearance.

Sport and Business.

From this mine, where a stay of about 20 minutes was made, the special train returned the visitors to the Golf club, between Negaunee and Ishpeming. Here in the club house a delightful luncheon was served by the ladies, and following, the crowd adjourned to the near-by base ball grounds to witness a set of Cornish wrestling matches and a specially scheduled base ball game between the teams from Ishpeming and Negaunee, which Ishpeming won.

The first meeting of the institute was held Wednesday evening, following a dinner at the Nelson house, at the Ishpeming Opera House. It was called to order at 8:15 with President M. M. Duncan in the chair. Mr. Duncan, in a very interesting address, presented to the institute the question of employers' liability in the matter of accidents to the miners. The protection available to miners in the event of injury is now very meager and uncertain, and practically the entire burden growing out of accidents is placed, under present conditions, upon the injured man, or, in case of death, upon his family. Mr. Duncan suggested that an investigation be made of the systems of protection now being practiced in England and Germany, and that suitable laws should be enacted automatically protecting the injured, without regard to who should be blamed for the accident.

The first paper of the evening was presented by J. E. Jopling, of the Cleveland-Cliffs Iron Co., upon "Capillary Attraction in Diamond Drill Test Tubes." The investigations of Mr. Jopling have shown that in the ordinary methods of determining the angle of drill holes by the use of hydrofluoric acid in test tubes up to ½ inch in diameter, the capillary attraction is sufficient to cause an error up to 14 degrees. By experimenting with larger tubes, this departure from the accurate angle was reduced to about 4 degrees, but even under such conditions capillary attraction shows itself to be a source of error of very appreciable extent. Mr. Jopling's paper was accompanied by drawings. The paper prepared by Frederick W. Adgate upon "Sinking Reinforced Concrete Shafts Through Quicksand," being in printed form in the hands of the members, was read by title only. This paper was a very excellent description of the work of the Foundation Co., in the mining district, a work which has been successful in meeting conditions too severe for ordinary methods.

Concrete Shafts.

In connection with the subject of concrete shafts, William Kelly, general manager of the Penn Iron Mining Co.'s group of mines at Vulcan, Mich., gave a preliminary and brief description of the concrete lining of the Briar Hill shaft, recently put down at the above mine. The complete description of this work had not been prepared, but it will appear in the proceedings of this meeting. The Briar Hill shaft is a little more than 800 feet deep and was put down in soil that was not water bearing, the explanation being given by Mr. Kelly that the use of concrete was simply to obtain a more permanent and fireproof lining than timbers would afford. A circular section 14 feet in diameter was adopted for the shaft, the walls of which were designed to have an average thickness of 18 inches of concrete. The main dividers are two 8-inch channels with smaller channels at right angles separating the shaft into skip ways, lad-

der and pipe ways. The situation of this shaft was such that rock and sand for the preparation of the concrete could be very easily and cheaply obtained, and in general all conditions were favorable to the use of concrete. Steel plate forms were used in placing the concrete instead of wood. Mr. Kelly estimated that the approximate cost of the lining from the surface to the ledge was about $104 a foot, from the ledge to the seventh level, a depth of about 550 feet, the cost was $75 a foot; and below that depth, where it was necessary to hoist the dirt, the cost was approximately $87 a foot. These costs represent a saving over the cost of timber for the same work of about $5 a foot.

Wood Preservation.

With regard to the paper on biographical notes, J. H. Hearding explained that the past year had given them little opportunity to prepare the material he had had in mind for presentation. He made several suggestions, naming individuals, concerning whom he asked the assistance of the institute members in obtaining a record of their biographies. Mrs. Hearding reported that the work of the committee appointed on this subject was being steadily prosecuted. A very interesting paper was then read on the subject of wood preservation, with especial reference to mining timbers, by John N. Nelson Jr., engaged in the United States forest service. Mr. Nelson's paper was illustrated with lantern slides and presented very entertainingly the methods now being used in preparing wood for service where conditions tending to promote premature decay prevailed. At no place more than in mines, where the timbers are subject to dampness, is the loss from decay of timbers very great. Mr. Nelson pointed out how the decay of one part of a timber frequently necessitates the throwing away of the entire piece. Slides showing the comparative appearance after a period of service of prepared and unprepared timbers illustrated very clearly the work that can be done in preserving wood. A description of the methods and machinery used in preserving timbers was also included in the paper. A number of practical suggestions were made by Mr. Nelson as to the causes of decay and a clear explanation of the condition under which fungi grow was given. This was the last paper of the evening, and following the appointment by the chair, of a nominating committee, and an auditing committee, the meeting was adjourned to meet again at Munising the following evening.

Thursday morning the two special institute trains, made up of sleepers, dining car and private car, left Ishpeming at 8:45 for Marquette. On the way a stop was made at the Queen mine group, which is operated by the Oliver Iron Mining Co. Here a very complete and modern power and hoisting equipment is installed. The next stop was made at Pioneer furnace, where the installation of the Gayley dry blast system was of particular interest.

Engine Works Viewed.

Shortly before noon the train brought the party to the new plant of the Lake Shore Engine Works, at Marquette. This plant, which has been erected about a year, is a modern foundry and machine shop, especially equipped to turn out mine hoists and general jobbing work. The inspection of the plant, which stands almost alone in size and equipment in that section, was very interesting. More lasting, however, in its impression upon the visitors was the white fish dinner which this company served to the institute members as its guests on the shore of Lake Superior.

Promptly at 1 o'clock, the day being typical of the best that northern Michigan weather affords, the entire party embarked on a steamer for Munising. The trip of about 50 miles on Lake Superior was splendid and the entrance into Munising harbor along the west shore of Grand Island, was very beautiful. The arrival at Munising was in time for dinner, which was served on the train. The evening meeting was held in the Alger county court house, and President Duncan introduced President Anderson, of the Munising Business Men's League, who welcomed the Institute to Munising, to which William P. Belden, of Ispheming, responded. The opening paper was presented by Thomas B. Wyman, in the employ of the Cleveland Cliffs Iron Co., at Munising, and was upon the subject of "How Reforestation May Be Applied to the Mine Timber Industry." Mr. Wyman pointed out the immense requirements of timber for mine purposes and stated that some 6,000 acres of timber was required per year for the iron mines. To meet this great demand the necessity for greater encouragement of timber growing must be provided for, Mr. Wyman maintained, and greater provision should be made for the protection of forests. To this end he suggested the forming of an association of land owners, each contributing a certain small sum for the hiring of a larger number of wardens. The paper also outlined in detail a new system of taxation of wooded land based on a classification of soils, and which would have for its object both a reduction of present taxes and a fairer assessment. This paper was followed by a report on mine accidents by John T. Quine, of Ishpeming.

Mine Accidents.

Mr. Quine related some of the provisions which are now being made for the greater protection of the miners, and his paper included a great many statistics showing in detail the conditions and the number of accidents in various mining communities. Mr. Quine's paper contained much valuable information. No other papers were presented, and in this connection it is suggested that some effort be made to improve the manner in which the question of papers for these meetings is handled. As it is, common opinion accepts the business meetings as the least valuable and interesting feature of the trips, whereas, they should be at least on a par with the balance of the program. At the meeting of the Institute this year, but one paper out of the 12 appearing on the program was in printed form and in the hands of members prior to the meeting. If the Institute is to profit by the experience of other engineering societies, it will insist in the future that all papers to be offered at the meeting shall be in the hands of the secretary in time to be printed before the meeting, and that the program shall not include them unless they are so prepared. It would then be unnecessary to read any of these papers during the session, which may better be given to discussions of the subjects offered. The Munising meeting closed with the presentation of the reports from the treasurer and auditing committee, the report of the council including the names of 41 applicants for membership and the report of the nominating committee, presenting the names of the following officers for the ensuing year: President, D. E. Sutherland; vice presidents, J. H. Bush, F. W. Spurr, J. H. Rough; managers, C. E. Lawrence and W. J. West; treasurer, E. W. Hopkins; secretary, A. J. Yungbluth. While the next meeting place was not announced, the regular succession will take it to Gogebic range.

During the morning of Friday the members were at liberty to visit Grand Island, the game preserve and summer place, owned by the Cleveland Cliffs Iron Co., or to visit the paper mill,

veneer works, cooperage plant and other points of interest at Munising. At 11 o'clock the Institute train left over the Munising railway for Gwinn and Princeton, in the new field being developed by the Cleveland Cliffs Iron Co. Of particular interest in this district, were the concrete shafts put down by the Foundation Co., at the Smith and Kidder mines, as described in Mr. Adgate's paper. The Stephenson mine, the shaft for which was sunk in the spring of 1904, was also visited. The surface equipment at this mine is especially complete, and central power plants and shops for this district are located here. From the Stephenson mine the party was driven through the new town of Gwinn. As has been written of this town before, its site is one of the very beautiful places in the Northern Peninsula, and it is being built under model restrictions and in the very best manner. The laying out of the town has been in charge of an eastern landscape artist, and already Gwinn has attained to a very pleasant appearance. The special train left Gwinn at about four o'clock, returning to Ishpeming in time for the members to depart on various evening trains. The meeting was very enjoyable and the trip held the interest of the members to an extent beyond what might be expected in going over ground so familiar.

NEWFOUNDLAND ORE SALES FOR 1910.

Contracts have just been closed with several eastern furnaces, principally in the district adjacent to Philadelphia, for a total of 250,000 tons of Wabana (Newfoundland) iron ore for 1910 delivery. This is an increase of 50,000 tons over the sales for the current year, and some additional ore may later be available for this country, as development work carried on at these mines has shown up extremely heavy deposits and facilities for their working have been improved to an important extent. The contracts involve the same unit price, duty paid at seaboard, as in the case of sales for this year, but the tariff reduction means a net increase of one half per cent to the producer. This ore will be shipped during the seven months from May to December, as floating ice renders its movement impossible during the late winter and spring. The mining company operates its own fleet. It is interesting to note that a considerable part of these workings, which are of great depth, extend well out beneath the ocean.

HANNA INTERESTS

Will Build Two Furnaces—Will Equip Old Stack with Casting Machine.

Buffalo, Aug. 31.—The Buffalo Union Furnace Co., having three stacks at Buffalo, will immediately equip one of its furnaces with pig casting machinery for making basic iron. As reported some time ago, the same company will build two furnaces on the Niagara river site lately acquired from the parent concern, M. A. Hanna & Co., Cleveland, and one of the new furnaces will be equipped to make basic in addition to Bessemer foundry iron.

These improvements will relieve the basic situation somewhat as the demand here for basic has long since exceeded the supply.

ANTI-DUMPING DUTY ABROGATED.

By recent action of Canadian authorities, the 15 per cent "anti-dumping" duty on tin plate has been abrogated. This was imposed in addition to the regular duty of 5 per cent, and was to protect a tin plate plant started at Morrisburg, Ontario. It is understood that this plant no longer manufactures tin plate but is now confining its attention to sheets, having recently awarded contracts for additional sheet mills. It is further understood, however, that this abrogation may be only temporary and that the extra duty may be restored in case the production of tin plate is resumed.

NEW RITER-CONLEY CONTRACTS.

Pittsburg, Pa., Sept. 1.—The Riter-Conley Mfg. Co., Pittsburg, announces the following important construction contracts recently taken: Coal docks including trestle work and storage buckets for the Charlotte Dock Co., near Rochester, N. Y., 2,500 tons; 12-story Spaulding building, Portland, Ore., on which J. W. Stewart & Co. are general contractors, 1,500 tons; tube mill building for the Bridgeport Brass Co., Bridgeport, Conn., 1,000 tons; bridges for the Chicago, Milwaukee & St. Paul railroad, 1,500 tons; shops for the Chesapeake & Ohio and Chicago, Burlington & Quincy railroads, 3,000 tons, and 8,000 tons for other miscellaneous bridge and building work. The company is also engaged on a number of large export contracts.

Another foundry company has entered the market for from 3,000 to 4,000 tons of No. 2 for first half. A steel foundry has purchased 100 tons of Bessemer for delivery this year at $17, valley.

There has been much anticipation among the trade of an advance in merchant pipe, effective Sept. 1, but none has been announced by the leading interests.

F. E. Richardson has been chosen president and treasurer of the Pittsburg Forge & Iron Co. to succeed the late Calvin Wells. Mr. Richardson has been secretary of the company.

INCREASING INTEREST IN RAILS FOR NEXT YEAR.

(Special Telegram.)

New York, N. Y., Sept. 1.—Interest is growing in rails for next year's delivery, as is indicated by requests that places be held for some large blocks until specifications can be prepared. The greatest activity, as is always the case, is in the Chicago district, where it is anticipated the supply, even with the Gary plant operating full, will not equal the demand from the district served by that center. The leading interest reports 12,000 tons of open-hearth rails for this year sold to the Chicago Great Western, 10,000 tons to a frog and switch company, 3,000 tons to the Baltimore & Ohio, and scattering sales of 1,000 tons. The Atchison & Southern railway tonnages previously announced have been entered. The Missouri Pacific is in the market for 40,000 tons.

Will Not Go Out of Business.—The persistent rumor that the Union Gas Engine Co., San Francisco, is expecting to go out of business is authoritatively denied by the company. H. P. Goodman, president, says, "Closing up and going out of business is the most remote idea we have. Our business is picking up very materially, and we are able to meet all demands." Union Gas Engine Co. is one one of the largest gas and gasoline engine manufacturers in United States.

Victory Won.—The Pittsburg Valve, Foundry & Construction Co. has won a signal victory in its contention for the contract for the valves in the high pressure water line at San Francisco, and the Board of Public Works of the California city is going to re-advertise on the whole job.

The Central States Bridge Co., Indianapolis, Ind., has been awarded the contract for the erection of a 90-foot steel bridge over the Pelican river at Rhinelander, Wis.

NEW VESSELS

For Freight and Passenger Service on the Great Lakes.

As indicated in earlier issues of THE IRON TRADE REVIEW, orders for lake vessels are materializing. Three were placed last week and one was placed this week. The Northern Lakes Steamship Co., composed of Cleveland parties, gave an order to the Great Lakes Engineering Works of Detroit for three freighters, the bonds of which have already been underwritten by the Union Trust Co. of Detroit. The fourth steamer is for the Lake Erie Excursion Co., which operates between Buffalo and Crystal Beach. Contract for this steamer has been awarded to the American Ship Building Co. She will be practically a duplicate of the Americana. Other contracts are pending and definite annoucements may be expected at any time.

Ore figures, of course, have not as yet been compiled, but sufficient is known of the movement to warrant the prediction of a record movement. It will likely exceed the 7,000,000 ton mark. Receipts of ore at Lake Erie ports have been very heavy during the past week and vessels have had to wait outside. This indicates a tremendous movement, because the unloading capacity is not what it was a few years ago. It has practically trebled.

It is observed that the rates in the subsidiary trades are stiffening, even lumber having advanced 25 cents.

Serious accidents have been rather numerous, the latest being the sinking of the steamer Collingwood in collision with the George L. Craig in the Detroit river. She lies in 35 feet of water and it will cost about $14,000 to raise her. The work will be done by the Great Lakes Towing Co.

DEATH OF DALLAS C. BYERS.

Dallas C. Byers, president of the A. M. Byers Co., Pittsburg, manufacturer of wrought iron pipe, died Aug. 26 at Dinard, France, from a stroke of paralysis Mr. Byers had been in ill health since early last spring when he went abroad in the hope of recuperating his strength. Recently he underwent an operation and was in a weakened condition when stricken with paralysis. Upon his graduation from Yale in 1898 Mr. Byers became associated with the A. M. Byers Co. and upon the death of his father, A. M. Byers, became president of the company. He was 35 years of age and was a native of the North Side, Pittsburg. Mr. Byers was fond of athletics and was prominent as a sprinter while in college and afterwards as a golf player. He was a member of well known Pittsburg clubs.

ALLEGHENY COUNTY'S STEEL PRODUCTION.

The following table taken from the Bulletin of the American Iron and Steel Association shows the number of blast furnaces and the number of rolling mills and steel works in Allegheny county, Pa., together with details as to the amount of their product in the years 1907 and 1908:

Details—Gross tons.	1907.	1908.
Furnaces built and building ..... No.	47	47
Production of pig iron....	5,438,233	3,917,938
Rolling mills and steel works ..... No.	66	64
Production of Bessemer steel	2,972 286	1,361 895
Production of open-hearth steel	3,883,014	3,106,797
Production of all other steel	50,290	20,764
Total production of steel..	6,905,590	4,489,456
Production of all kinds of rails	770,333	269,735
Production of structural shapes	889,066	463,761
Production of plates and sheets	1,346,517	715 164
Production of other rolled products	2,632 314	1,410,586
Production of all rolled products	5,638,230	2,859,246

In 1908 Allegheny made over 56 per cent of all the pig iron produced in Pennsylvania and over 24.5 per cent of all that was made in the country, which compares with 47.9 and 21.1 in 1907.

The county made 60.1 per cent of the production of Bessemer and open-hearth steel ingots and castings in Pennsylvania in 1908 and 56.1 per cent in 1907, while of the country's production it made 32 per cent in 1908 and 29.5 per cent in 1907.

The county made 54.7 per cent of the rails made in Pennsylvania and 14 per cent of those made in the whole country in 1908 against 68.1 and 21.1 per cent in 1907.

In sheets the percentages for the county as compared with the state and country are respectively 46.7 and 26.9 in 1908 and 50.7 and 31.6 in 1907.

For all kinds of finished and rolled steel the production of the county was 50.9 per cent of the state production and 24.1 of the production of the country in 1908 against 55.9 and 28.3 in 1907.

The McDonough Mfg. Co. of Eau Claire, Wis., has been awarded the contract for the erection of the new saw mill plant of the Diamond Lumber Co. of Green Bay, Wis. The new structure, 60 x 180 feet, will be of steel and concrete.

PERSONAL.

Frank C. Neale, President of the Kittanning Iron & Steel Mfg. Co., Kittanning, Pa., has sailed for a short European trip.

W. Owen Davis division freight agent of the American Steel & Wire Co. with headquarters at Pittsburg, has been transferred to Chicago.

W. B. Gresham, formerly salesman of the Carnegie Steel Co. at Cleveland, assumed his new duties in charge of the exports of the Lorain Steel Co. at the office of the United States Steel Exports Co., New York, Sept. 1.

David D. Lewis, popularly known as the father of the steel rail in Canada, has resigned as general manager of The Algoma Steel Co. at the Soo to become associated with The Southwark Foundry & Machine Co. of Philadelphia.

The Chamber of Commerce at Sheffield, England, recently entertained Judge Elbert H. Gary at dinner. Cables from the other side quote him as saying that he has no objection to free trade in America if other countries will adopt the same policy.

Charles M. Schwab has just completed a flying trip through Texas and the southwest, where he inspected various properties in which he is interested. In Chattanooga on his way back, Mr. Schwab gave out a highly optimistic interview as to the prospects for business.

J. A. Durfee has been appointed general superintendent of the plant of the Southern Iron & Steel Co., Gadsden, Ala. A. W. Taylor, now with the Atlanta Steel Co., Atlanta, Ga., will be superintendent of the open-hearth and blooming mill departments of the Alabama City plant of the Southern Iron & Steel Co.

Wm. H. Singer, a retired Pittsburg manufacturer and financier, was painfully injured in an automobile accident near Narragansett Pier, R I., Aug. 25. Mr. Singer was one of the organizers of the firm of Singer-Nimick & Co., Pittsburg, which existed until 1900, and is a director of the Carnegie Steel Co. and the Crucible Steel Co. of America.

A. A. Wagner who for the past two years has been assistant engineer of the United States engineer's office at Buffalo with supervision over the sheet steel piling at the ship lock entrance to Buffalo harbor, has entered the service of the structural department of the Jones & Laughlin Steel Co. at Pittsburg, and will be in charge of the sheet steel piling of that company.

CENTENARY OF A GREAT ENGINEER.

Great interest is being taken in the industrial and engineering district of Birmingham (England) in the centenary of the death of Matthew Boulton, which occurred on Aug. 17, 1809. Bou'ton had a large share with Watt and Murdoch in those engineering and metal developments which had so much to do with the development of British manufacturing industries, and subsequently of similar enterprises in foreign countries. Matthew Boulton was a man of great ability and it is said his rule in life was to be at the top of everything he undertook. Before he met Watt and Murdoch, he had established a successful steel toy business and in 1762 he built the Soho works at a cost of £20,000. Six years later, he introduced the manufacture of silver plate and the making of ormolu clocks. In 1768, he met James Watt, the inventor of the steam engine, and the acquaintance was mutually beneficial because, while it enabled Watt to develop his steam engine to the stage of practical usefulness, it furnished Boulton with the improvement upon the water wheel which he so much needed. The first steam engine was erected in 1770 at the Soho works and the production of steam engines soon became a great staple industry at Soho. Later on he applied the steam engine to the stamping of metals, setting up the Soho mint and designing the whole of the machinery. Orders poured in from all parts of the world, and the famous Boulton pennies started on a new era in the world's coinage.

It is remarkable that the gasholder made by Murdoch for Boulton and Watt's works in 1798 is still in existence and in working order at the works of W. and T. Avery, famous as the manufacturers of weighing machines. Quite a number of o'd works still employ the old fashioned beam engine invented by Watt and some of them work very satisfactorily.

The method of celebrating the centenary in a practical way is being discussed at Handsworth. Probably one method will be the establishment of a scholarship in metallurgy tenable in Birmingham University and other suggestions include the erection of a statue in front of Handsworth Council House. It is just possible that a new area called Bou'ton Square will be laid out in Handsworth at no great distance from the site of the Soho works. A centenary sermon is to be preached on Sept. 22 in the Handsworth Parish Church, where Boulton, Watt and Murdoch are all buried and where there already exists a mural monument to Boulton. This consists of a broad base with a long inscription setting out his talents. Above is a tablet of gray marble. In the center of the tablet is a large circle deeply sunk, in which is a fine bust by Flaxman. There is general determination to make the commemoration worthy of a great genius and one of England's most notab'e personalities.

ORDERS DECLINED.

A report from Elmira, N. Y., states that a large repair shop will be constructed by the Corning & Painted Post Trolley Co., besides extending the company's trackage. The Read-Coddington Co., of Niagara Falls, has been awarded the contract to complete the tunnel trunk sewer in that city. The work is to be finished by Jan. 1, and is an extensive improvement. The month of August among the finished product interests at this point has made a splendid showing so far as actual bookings of business is considered. One manager has stated that August led every preceding month in the history of the Buffalo office for the amount of tonnage placed, and this is by no means an unusual case, as the orders received are far in excess of the expectations. The worst feature of the market during the past month has been the necessity of declining much desired business owing to the rush in the mills and the overcrowded conditions. Had the various interests which were unable to fill orders been prepared to do so, the August closings would have been surprising. One of the encouraging features of the local situation is found in specifications on current business. These have added in a large measure to the healthy tone of the iron and steel market. Specifications have come in steadily on current business and have also shown continued increase. The closing of August business leaves the market in a very satisfactory condition and it will be surprising to many if September does not equal or exceed in strength the conditions of the past month.

The Lake Erie Excursion Co., operating the passenger steamer Americana between Buffalo and Crystal Beach, will build a duplicate steamer. This company was organized two years ago and has enjoyed a prosperous existence. The small steamer that was chartered as a companion to the Americana proved too small to handle the traffic.

STEEL BUILDINGS

Not Injured by Mexican Earthquake —Furnace Sold.

City of Mexico, Aug. 25.—During the recent earthquakes in Mexico City, the new steel buildings escaped with absolutely no damage, demonstrating the advisability and practicability of using the steel constructed buildings on the Mexico City site. The city now has a number of steel buildings, three, four and five stories high.

The iron furnace and iron deposits at Union de Tula, Jalisco, have been sold to an American-English company, known as the Mexico Iron & Steel Co. The price paid for the properties is said to be $500,000. The purchaser is represented by J. W. Dickinson, of Boston, Mass., and George H. Morrill, of Massachusetts, will head the company. These deposits have been worked more than a hundred years, making a high grade of charcoal iron. Recently they have been under lease to an American company, but have not been operated extensively. They are about 25 mi'es off of the railroad.

The iron deposits in Lower California are again being considered as a source of supply for a proposed steel plant to be built at San Diego, Cal. The iron deposits in question are controlled by L. J. Webb, of San Diego, who is also interested in the formation of the San Diego company. These are not the same deposits which were reported as concerned in the negotiation with the Japanese government.

A contract has been entered into by the national railways of Mexico to expend 4,000,000 pesos in the construction of a railroad west for 100 kilometers from Durango. The primary object of the road is to reach an important timber district. The interest on the cost of the road is guaranteed by the state of Durango, and the timber company. Work will be commenced at once. It is said that the Monterey iron and steel plant will furnish the rails for the extension.

The concession for the proposed railroad from Monclova to Chihuahua is involved in the political imbroglio in the state of Coahuila, and there is uncertainty now as to the fate of the undertaking. The railroad would make available some important iron deposits in northern Mexico.

The general trade conditions in Mexico, while somewhat improved, are more or less affected by uncertainties as to the political situation, which is becoming acute in the northern part of the republic. The authorities seem to have the situation firmly in hand.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND.

BUFFALO.....932 Ellicott Sq.
CHICAGO.....1328 Monadnock Blk.
CINCINNATI.....First National Bank Bldg.
NEW YORK.....1005 West Street Bldg.
PITTSBURG.....510 Park Bldg.
SEATTLE.....302 Pioneer Bldg.

Subscription, United States and Mexico, $3.00 per annum. To Canada and Foreign Countries, $4.50. The price of copies issued three months or more previous to date of current issue will be 25 cents each. Advertising rates furnished on application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co. will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

European Agents: The International News Company, Breams Building, Chancery Lane, London, E. C., England.

ENTERED AT THE POST OFFICE AT CLEVELAND AS SECOND CLASS MATTER.

PRINTED IN AN OPEN SHOP.

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

January	5,506
February	5,346
March	5,396
April	5,508
May	5,533
June	5,551
July	5,572

September 2, 1909.

TEN YEARS OF REPUBLIC COMPANY.

The Republic Iron & Steel Co. could have celebrated the tenth anniversary of its organization May 11 last, but as the first fiscal year was made to include the fractional year to June 30, the company may be said to have become ten years old at the close of the fiscal year for which the regular report has just been made public. In this respect the company stands by itself among the important iron and steel mergers which were accomplished in the consolidation period 1898, 1899 and 1900. The majority of those consolidations were merged into the United States Steel Corporation in 1901 and, as the fitting together process largely destroyed their individuality, the only decennial which could be recognized in their case would be that of the Steel Corporation itself. Of other important companies formed in the consolidation period, the only one outside of the Republic Iron & Steel Co. which was a consolidation of a considerable number of independent iron and steel making properties is the Crucible Steel Co., and its decennial will not be until July 21, 1910.

The decade of continuous corporate life of the Republic Iron & Steel Co. is therefore of peculiar interest. In some respects, the company has had a checkered career. There have been changes in the financial control of the company, but they have not interfered with the continuous management of the business itself. There have been important changes in the relative importance of the different materials produced but these changes have constituted an evolution towards an alignment promising the most profitable operations. There have been two interruptions to the payment of dividends on the preferred stock, but these resulted from an ambition to enlarge the company's product; the company has the improvements and the back dividends have been made up. The dividends passed in the first period were paid shortly afterwards, and the 7 per cent passed in the twelvemonth to April 1 last has been made up by the payment of ¼ per cent in the April quarter, and the declaration of a lump dividend of 6¾ per cent, payable ¾ per cent Oct. 1 next, and 1 per cent on the same date in each of the six years following.

The development of the manufacturing properties has been continuous. At the outset properties comprised practically nothing but some two score of iron mills, no better than iron mills usually are, and perhaps not so good. At present the company has in its three Pioneer furnaces what is claimed to be the finest blast furnace plant of its size in the south, while at Youngstown, starting with a couple of little second hand kettles, it has by successive rebuilding and improving produced what is perhaps the finest specimen of a two 10-ton converter plant in the world. In the month just ended, a month usually not signalized by the making of large outputs, the plant easily broke all its own monthly records, and by producing some 60,000 gross tons of steel ingots showed a potentiality which it is doubtful any plant of similar nominal size can rival. So rapidly has the plant been increasing its output that it was on the 26th of the month that is passed all its previous monthly records for the output of rolled steel.

The financial operations of the company have been of interest. Funds for a portion of the improvements made in the past had to be provided by the issue of short term notes, which in turn were supplanted by a first mortgage bond issue of $10,000,000, of which only about $8,000,000 remain outstanding, the bonds being subject to retirement much more rapidly than is frequently the case in iron and steel enterprises. The pipe plant being built is financed by the united credit of the company and a company organized by friendly interests, the stock of which is optioned to the Republic company, while the plant itself is leased to it. The strength of the company after these operations is illustrated by the fact that it is able to sell at par the remainder of the preferred stock authorized at the time of its organization. In response to the circular of July 27 last, offering some remaining $4,500,000 of preferred stock, more than 85 per cent has already been subscribed by stockholders at par. The destination of the funds thus to be provided is referred to only in general terms in the annual report just made. It may be added that the purpose is to erect an open-hearth steel plant at Youngstown, with a capacity of about 25,000 tons of ingots monthly, using direct metal from the Hazelton furnaces. Ultimately the Hazelton group will probably comprise five stacks, which will provide metal for a still larger steel production.

While the iron mills originally consolidated did not represent the capitalization adopted, the company did not capitalize raw materials to any extent, but has since fortified itself in this direction. At the outset, its Lake Superior ore reserves were estimated at only 2,500,000 tons, while the present estimate is 36,293,140 tons, enough to

carry the largest blast furnace operations contemplated for a period of a quarter century. The company has, indeed, been a fairly large seller of ore at times.

Earnings in the fiscal year just ended were satisfactory considering the conditions. The profits applicable to dividends were 8.3 per cent larger in the second half of the fiscal year than in the first half, despite the fact that the low point for prices was in May last. The surplus for the year was $1,221,008, this being after the payment of 2 per cent dividends on the preferred stock. The payment of an additional 5 per cent, to make up the usual rate for a year, would have absorbed $1,020,845 additional, but would still have left some $200,000 applicable to surplus.

STRUCTURAL STEEL BUSINESS ON THE PACIFIC.

San Francisco and other cities of the Pacific coast have encountered some very serious difficulties in meeting eastern competition in the fabricating and erecting of structural steel and the following letter from the commissioner of the California Metal Trades Association is extremely interesting, especially in view of the effect of the new tariff law:

Editor IRON TRADE REVIEW:—

The structural steel firms from Los Angeles, Portland, Seattle, Everett and San Francisco are again making an effort to secure a differential of rates on fabricated and unfabricated steel beams from points east of the Mississippi to Pacific coast terminals from the transcontinental railroads.

For the last six months the steel firms of this city in their endeavor to show the property owners and architects that they can do the work on the large buildings as well as the small, to meet the competition of the east, to keep their wheels turning, their smoke stacks belching, and to give employment to the workingman, have been accepting the contracts at practically cost price, or just about enough to keep them in bread. There has been really no profit whatever, and they have sacrificed all their time and profit, waiting and hoping that the railroads would give them at least a differential of $3.00 a ton on the shipment of plain steel from the east.

The small jobs have been let here for the reason that the architects and general contractors are in a hurry to get them out and will not send them east, as it takes too long. If it wasn't for that, the local firms would not have survived this long. Even in the small jobs, the competition is so keen that the fabricators are cutting their own throats to get the business. Can they survive very long on that? Is that helping local manufacturing? Will it make this a manufacturing city?

It is the same in the other iron and steel industries: they never get any real first-class work; it is sent east, because, we find, the local buyer has been educated to buy from the eastern manufacturers' agents who have settled here since the fire in droves. It isn't because we haven't the different commodities, equipment, factories and various industries needed by the local buyer; it is because our people need to be educated to buy at home.

At the present time and for some years past this city has been nothing but a big repair shop.

If we are to make any profit at all on structural steel beams, the railroads must help us. It is up to them. Why shouldn't they do it in view of the fact that when we ship our steel from the east, we buy the long lengths for stock and what is necessary for the building in the lengths as well? The eastern fabricator sends only the required length cut up ready for the building. In other words, there is an actual loss to us of 10 per cent on every ton of steel shipped in the scrap that is cut from the beams to suit the building. In the east, the fabricator has the length cut to order in most cases and sent to his shop by the mills. Therefore it is to be seen that proportionately to every building erected we carry at least 10 per cent more than the easterner or the railroads.

That is why we believe, if we are to compete with the east successfully, the railroads can help us, and we are sending letters to docket with the transcontinental freight bureau to be taken up at their next meeting.

It may be puzzling to many why, at this time, and up to a year ago, after the present rate on structural steel has been so long in force, we are so anxious to secure a differential on the plain and finished beams from the east to the coast terminals. In San Francisco and Los Angeles, 20 years ago the terms "structural steel," "fabricated" and "unfabricated" were unknown in this business. In those days, the shops doing building work (I find from some of the oldtimers) were foundries and architectural iron works. All of the columns, bases, lintels, etc, were of cast iron; steel in structural beams was practically unknown; the beams and girders used were of iron. The foundries used pig iron and coke of foreign manufacture, brought here by water. With the advent of steel shapes and the skyscraper, the products of the American mills became more generally used, and not until the Baltimore fire did cast iron as a building material get a set back, finally resulting in its death in the fire of 1906. Up to that time, it made very little difference to the Pacific coast manufacturers what the freight was and whether there was a differential.

The changed conditions in material made a change necessary in structural manufacture, and the coast, realizing these changed conditions, arose to the occasion and today the Pacific coast shops are more modernly equipped, perhaps on account of the new machinery, than those of any other city in the United States, and yet we are not getting the business.

A year ago, when we found that 75 per cent of the steel contracts were going east, we made every effort to keep some of the work here for the benefit of the employer and the workingman. Appealing to the architects and contractors, property owners and the newspapers, writing 10 000 letters in that time to those same people, our shops taking jobs at cost price to hold the work here, we succeeded for a while in holding nearly 60 per cent of the steel business. But in spite of those efforts and sacrifices, we are again losing at least 60 per cent of the contracts to eastern manufacturers, and this percentage continues to increase.

It looks like a hopeless task to compete with the eastern fabricators if we do not secure at least a difference of $3.00 a ton in the shipment of steel shapes from the carriers.

As it is now, the only real good we are doing in taking the contracts at cost price is that the workingman gets the benefit of the labor at least. This we are quite willing to give, but where does the employer receive any benefit?

It is understood that the climatic conditions may favor our local manufacturing, yet, on the other hand, labor is higher than it is in the east, and for the same output we are forced to pay more than the eastern shops. Again, we are from 2,000 to 3,000 miles from the source of supply of raw material, which obliges us to carry a large stock on hand. Therefore this stock, with the scrap that is cut from the beams included, necessitates our carrying at least 20 per cent more than the eastern fabricators do on the railroads, which should see this truth to their own advantage.

The same facts apply proportionately to every shop on the Pacific coast, and demonstrate two things:

That the steel firms suffered a severe loss, and that the railroads hauled 1,843 tons more than they would have done had the work been fabricated in the east, receiving in freight therefor $27,645.00.

These are actual facts, and is it any wonder that the local plants are trying to secure a differential?

Last year we ordered shipped 20,000 tons of foreign steel from Belgium. This year already we have shipped 25,000 tons, a great loss of freight to the railroad.

Before our last appeal to the transcontinental freight bureau for a differential in January, the difference on structural steel from the east and from Belgium was $8 cheaper a ton in favor of the foreign material. After that meeting, the eastern mills made a difference of $4 a ton reduction on steel beams, which naturally made it easier to buy domestic material; but still the coast buyers continue to buy foreign beams, although they prefer to buy the domestic. Now, through the tariff reduction, the foreign steel is close to $6 a ton cheaper, thus making a difference of $10 in favor of the foreign beams, which the coast shippers one and all in the steel business are going to buy. The only trouble is the delay in the long haul from Europe.

The above facts and many more we are going to use in our arguments to the railroads. H. W. KERRIGAN.

Increased Capacity.—The Pittsburg Piping & Equipment Co. during the past two months has increased the capacity of its plant about 40 per cent by the addition of a new building and installation of new machinery to handle all classes of high and low pressure piping and equipment work. This company is now installing the complete piping for a new power house for the Cincinnati Traction Co. and a gas line for the South Covington & Cincinnati Street Railway Co. from Newport, Ky., to Cincinnati. The street railway company is going to use gas instead of coal as fuel.

AMONG MACHINERY MAKERS.

BUFFALO.

New Lathes Brought Out—Large Inquiry for Machine Tools.

Office of THE IRON TRADE REVIEW, 932 Ellicott Square. Aug. 31.

A leading western New York manufacturer of machine tools, engines and boilers stated today that the condition of the market holds up and is very satisfactory, and that he noted a good increase of orders for machine tools. He also stated that he had met various builders within the past few days and all reported a steady increase of orders. It was also predicted that within a few months there would be a large demand for machine tools. Inquiries for machine tools and much other heavy machinery are becoming more numerous and it appears to be the general consensus of opinion that there will be interesting developments in the machinery market at this point within a short period and machinery builders have in many cases taken steps preparatory of meeting an increased demand.

The W. P. Davis Machine Co., of Rochester, N. Y., has just brought out two lathes, one a 12-inch and the other a 14-inch machine, equipped with a quick change gear box, which permits a change from one feed to another or from one thread to another instantly. There are 30 changes possible ranging from 3 to 40 threads per inch. A machine of this gear has some interesting features. The index plates are very simple and may be operated without trouble or mistakes. On the same machines special or fractional threads may be used by changing each gear. The headstock is equipped with quick change of feed. The cones have four steps and the spindle is made of crucible steel forgings and the bearings are of phosphor bronze. In both these new machines there are notable improvements showing decided progress in the methods of lathe building.

The New York State Steel Co. is now operating its bloom mill and has planned to start up the billet mill about Sept. 10, when the entire plant will be in operation. At present the plant has two open hearth furnaces, a blast furnace and bloom mill in operation.

The E. R. Thomas Motor Co., manufacturer of automobiles, taxicabs, etc., is in the market for $20,000 worth of service machinery for its plant at Buffalo, the capacity of which must be greatly enlarged to meet increased business. A part of the machinery equipment will be supplied by foreign makers but the major part of the order will be filled by domestic concerns. Most of this equipment will be of the character used in the service department of large automobile builders. The company reports having already booked orders for 1,260 cars of the 1910 output. An additional building, 200 x 100 feet, is under construction which will be used for housing the inspection and tool departments. Factory No. 3, previously used for the manufacture of motor cycles, is now used for the taxicab branch of the company's plant.

The H. G. Trout Co., manufacturing propeller wheels for ocean, lake and power boat purposes, has produced a high speed wheel which has made several notable records in racing contests within the past 10 days.

CINCINNATI.

Inquiry for Heavier Machines Appears —Shops are Busy.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., Aug. 31.

The month of August has been more active in the machine tool line than might have been expected of a midsummer month and the shops are now behind on orders with a large part of the sttock accumulated during the depression disposed of. The past week has been productive of considerable business and inquiry.

Several large orders for upright and radial drills have been closed and some large orders are practically ready to be placed with agents wiring for best deliveries that can be made; one inquirer contemplating the purchase of 13 machines and another lot of 18 machines. This is somewhat notable, as the lighter lines have heretofore received more attention than the larger types and these inquiries are for heavy machines. The demand for milling machines holds up and the principal manufacturer in this center is working a night force and working the day force overtime, but is still far behind on orders. The smaller types of lathes are continuing to sell well and one manufacturer in this line is now sold up to Oct. 1. There is some improvement in the demand for planers and inquiry is increasing. Portable drills are enjoying a fairly good demand. There is an incessant call for machinists of all descriptions to augment the working forces in the shops.

It appears that the expectations of normal business by the fall of the year will be realized; and judging from reports from the manufacturers during the past week the outlook for September is bright. While some of the orders received are for stock to be placed on dealer's floors, a large number of the machines sold are going direct to the point of installation. Automobile shops continue a feature in the demand. The trade regards the improvement as substantial, and some manufacturers regret not having made more stock during the depression as a few orders have been lost through inability to make prompt delivery.

The Cincinnati Bickford Co. has received more orders during the past week than in any week since the depression and has a number of large inquiries under consideration, which will probably be closed within a few days.

The Cincinnati Milling Machine Co. is behind on deliveries and is running a day force overtime and working a night force.

The Cincinnati Lathe & Tool Co. reports business during August the best since the depression and is now sold up on all sizes to Oct. 1.

The Champion Tool Works Co. has enjoyed a steady run of orders and has a good inquiry in hand and the management is entirely satisfied with present conditions and outlook.

NEW YORK.

August Made a Fair Record—Some Important Inquiries Pending.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Aug. 31.

In spite of the fact that business has lagged somewhat because of the vacation season, August bookings are pronounced very satisfactory by local machine tool houses. Some few which shared heavily in the distribution of railroad orders during July have found the month just ending a little more quiet and its bookings considerably less, but the average seller has had no cause for serious complaint over the showing made. It is true, however, that business is still rather spotty; for instance, one large house reports the sale during the week of a lot of 30

lathes, the first important booking in this line for some time, and other classes of tools continue to show a spasmodic demand. At this writing it cannot be learned that the Fiat Automobile Co. has definitely awarded any of the contracts pending for its requirements at the new Poughkeepsie plant, but it is known that decisions have been reached on practically all these tools and the orders may go out any day. The Virginian Railroad, which has had a list aggregating about $30,000 in circulation for some little time, asked that all quotations be in by Aug. 30, and some definite announcement in this connection is looked for immediately.

Of considerable interest to the machine tool trade was the anouncement of President Marshall of the American Locomotive Co. in reference to the issue by that company of $5,000,000 5 per cent gold debenture notes to reimburse its treasury for the expenditure of about $3,500,000 on improvements at its various plants and to provide additional working capital. His statement was that contracts have been let for these improvements, from which it is assumed that the large crane inquiry, noted last week, has been closed. There have been no further developments in regard to the establishment of a large plant in the Gary district.

In connection with its application for the permission of the public service commission to issue debentures up to $16,500,000, the Long Island Railroad outlines an extensive program of further improvements during the next three years. Among the larger items are the following: Bay Ridge improvements, elimination of grade crossings, $1,000,000; purchase of 150 new motor cars, $2,700,000; double tracking and electrification on the north side, $1,000,000; and the electrical equipment of tracks and substations, $800,000. In all, the proposed expenditure is slightly more than $10,000,000; considerably more than $6,500,000 has been spent in the past three years

The Leslie-Elliott Co., Paterson, N. J., which was organized only a short time ago to manufacture boilers, tanks and stacks, has recently completed an 80-foot addition to its boiler shop. This is equipped with a 15-ton Shepard hand crane with a 3-ton auxiliary hoist.

Local machine houses have been figuring during the week on the machine tool requirements of the Virginian Railroad for its shops at Norfolk, Va. While the inquiry is not large in comparison to a few railroad lists recently circulated it involves about $30,000 worth of equipment. The orders will probably be distributed in the early future.

Some preliminary inquiries are being made in connection with the extensive plant which is to be built in the Waverly district of Newark, N. J., by the Gillette Safety Razor Co. A considerable tract of ground has already been acquired and it is understood that the plant will be exceptionally complete, even including facilities for rolling the steel required for the blades, and will render the company practically independent so far as the manufacture of parts is concerned.

The Weatherly Foundry, Weatherly, Carbon county Pa., has recently completed additions which practically double the capacity of its plant. A 5-ton Shepard hoist is included in the new equipment.

The local office of the Mesta Machine Co. reports a brisk demand for cut steel gears, a line of production recently undertaken by this company. Some substantial orders have been booked for sugar mill equipment abroad and preparations are being made for the handling of extremely large crops. Local sugar mill manufacturers are rushed with orders received some months ago, but the outlook for the coming year is pronounced very favorable.

MILWAUKEE.

Makers Have Confidence that Future Business Will Improve.

Milwaukee, Wis., Aug. 30.—The fact that there is plenty of confidence in the Milwaukee machinery and iron working field as to the coming fall and winter business is evidenced by the action taken by several leading concerns during the past few weeks in preparing for new additions and new plants. While but a few of the largest plants are operating at full capacity, present business is more than satisfactory.

The latest Milwaukee concern which has come forward with plans for a new plant is the Progressive Metal & Refining Co., which has completed all arrangements for the erection of a new foundry and refining works to be erected on Barclay street, between Washington and Scott streets. The building will be of concrete, steel and brick construction, two stories high and 80 x 160 feet in size and will cost about $15,000. The company has just increased its capital stock from $50,000 to $100,000 in order to prepare for a general expansion of its business

The Northwestern Malleable Iron Co. has placed more of its furnaces in operation. Nine of the company's 11 furnaces are now busy and officials of the company say that No. 5 and No. 9 furnaces, now idle, will soon be lighted. One furnace will be started within the coming week and the remaining one will be lighted within two months.

"Business is once more very encouraging," said F. W. Sivyer, president of the company.

The Allis-Chalmers Co., Milwaukee, has just received a contract for the construction of what is said to be the largest city pumping engine in the world. The engine will supply water for the city of Wheeling, W. Va.

"This is the largest pumping engine used for the purpose of supplying water to a municipality," said Will J. Sando, manager of the pumping engine department of the Allis-Chalmers Co. "The engine is triple expansion, crank and flywheel, standard, Allis-Chalmers type, and the low pressure cylinder will be 110 inches in diameter by 72 inches stroke. The engine will have a capacity of 20,000,000 gallons a day, and will have to pump against a regular domestic water pressure of 150 pounds per square inch. There will be two 20-foot flywheels, weighing 100,000 pounds each and the total weight of the engine will be about 2,225,000 pounds."

The Fairbanks-Morse Co., Beloit, Wis. awarded several contracts last week for the erection of its new warehouse addition. The building will be strictly modern and will cost about $10,000. It will be equipped with an electric crane. A recent order secured by this concern was for pumps from the California Oil Co, San Francisco, Cal., involving the sum of $130,000.

At the recent annual meeting of the stockholders of the Beaver Dam Malleable Iron Co., Beaver Dam, Wis., D. P. Lamoreux was elected president and manager to succeed the late Judge Lamoreux. Other officers were elected as follows: Lawrence Fitch, vice president; B. F. Sherman, secretary, and Peter Beule, treasurer. C. Starkweather, John W. Miller and C. W. Lamoreux were elected directors for three years. The board of directors authorized the construction of an addition to the molding department and the enlargement of the shipping department.

STEEL OPERATIONS DURING THE DEPRESSION PERIOD.

Through the courtesy of one of the largest independent steel companies, with an extremely varied line of production, we present on the opposite page a chart showing its weekly record of sales and shipments during the past two years and eight months, covering the very interesting period of the recent business depression. Both sales and shipments are cumulative for each year, that is, the figure for each week represents the average of that week and all preceding weeks of the year; this arrangement explains the rather violent fluctuations appearing during January and February of each year and the relative steadiness of the line during the remainder of the year. It is interesting to note that with this company the depression may be said to have extended almost exactly over two years; during the week of April 20, 1907, the average weekly sales (solid line) fell below the average weekly shipments (broken line) and it was during the week of April 17, 1909, that sales crossed above the shipments line to remain there permanently. In other words, for the two years between these dates shipments were to a greater or less extent at the expense of accumulated bookings, while for the last two or three months there has been a decided gain in the amount of orders on books. The lines are based on actual values and obviously no mention can be made of the scale on which the chart was drawn. The extent to which production was curtailed to meet the reduced demand is particularly noticeable throughout the year 1908, when both lines held extremely close together well toward the bottom of the chart. It will also be seen that bookings since early in June of the current year have been larger than at any time since about the middle of 1907.

Will Assist Foundries.—The San Francisco Castings Co., San Francisco, is the name of a sales corporation that has recently been formed for the purpose of enabling local foundries to bid on such work as would overtax the capacity of any one local shop. This organization has been perfected in view of the large contract which was awarded by the board of public works for the standard and special fittings that are to be entered into the construction of the auxiliary water supply system for the fire protection of the city.

WILL BUILD PLANT.

Electrical Products Co. Buys Site—Iron Works for Toronto.

Toronto, Can., Aug. 24.—The Electrical Products Co., in which Fitzgerald and Bennie, electro-metallurgical chemists of Niagara Falls, N. Y., have extensive interests, will establish a plant at Chippewa, Ont., on the Niagara river. A site of five acres has been purchased and construction will be commenced immediately. A contract has been entered into with the Ontario Power Co., Niagara Falls, to supply 1,000 horsepower as soon as the plant is ready for operaton, the company having the option of increasing it to 10,000 horsepower. Steel rails and other steel products will be manufactured. A by-law giving the company exemption from local taxation for five years will be submitted to the citizens.

The Grand Trunk Pacific Railway has awarded to Foley, Welch & Stewart the contract for constructing the second section of the line east from the Pacific coast. It extends for 140 miles from the Copper River eastward to Aldermere and the amount is approximately $10,000,000. The section includes several tunnels, one of which is half a mile in length and passes through a very rough country. The line will cross the Skeena river by a cantilever bridge 16 miles below Hazleton.

The edge-tool works of the James E. Warnock Co., at Galt, Ont., which have been closed for the last 18 months, have been sold to an English firm and will be re-opened shortly.

The Toronto city council has ratified the sale of 26½ acres of land in Ashbridge's Marsh on the eastern waterfront to the National Iron Works Co., as the site of an extensive plant.

The Grand Trunk Railway Co. has given the Kingston Locomotive Works a contract for 25 additional locomotives. The works have now orders ahead for many months.

President R. C. Harris, of the Nova Scotia Steel & Coal Co., who returned from England last week, stated that satisfactory arrangements had been made for the sale of the remainder of the company's bonds in London. He intimated that dividends would probably be paid before the end of the year.

The Pittsburg Valve, Foundry & Construction Co. has secured the contract for the by-pass connections for a high pressure gas line from the West Virginia fields to Cincinnati.

LAKE SUPERIOR MINING NOTES.

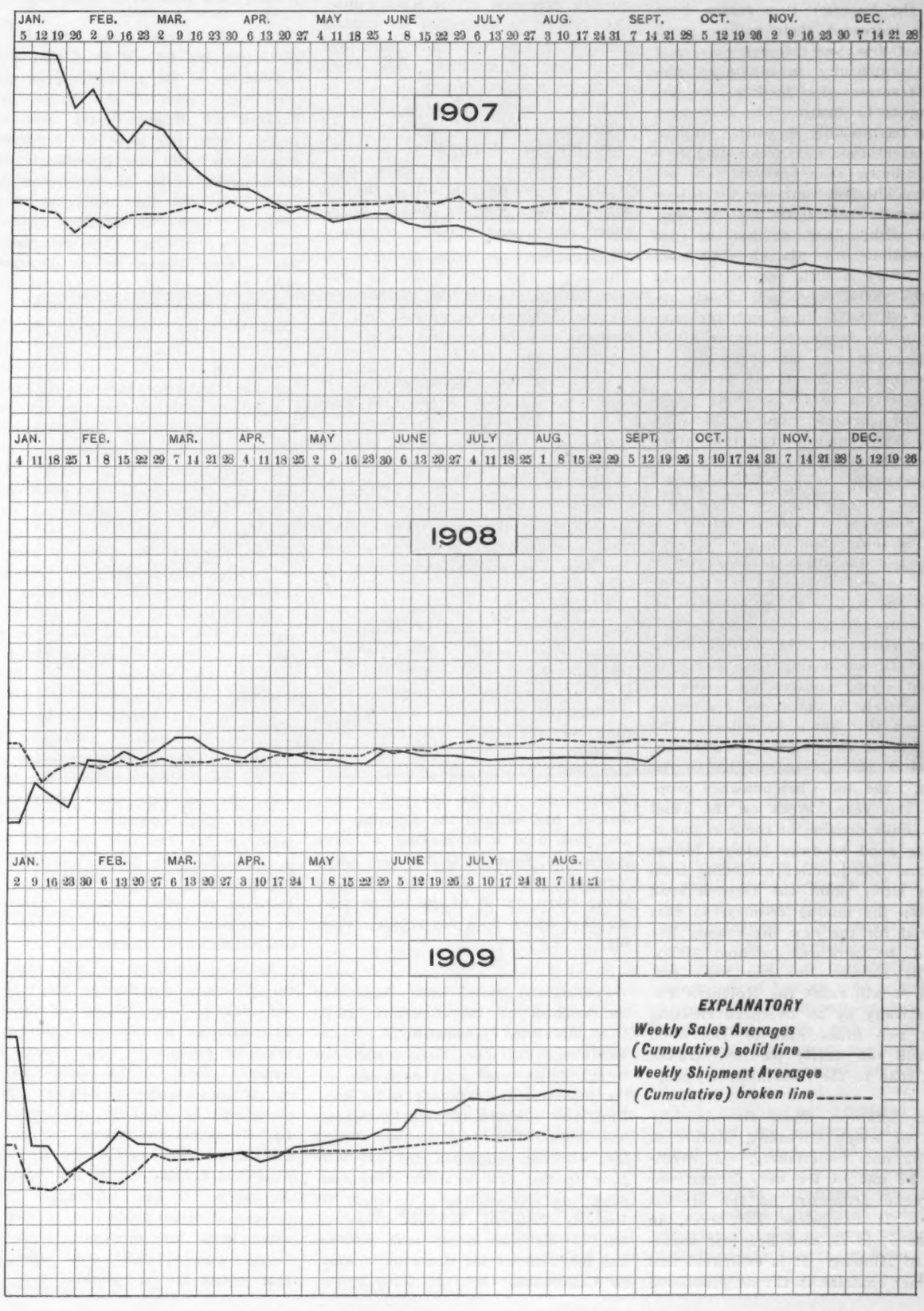
The new Buckeye mine, the property of the Reserve Mining Co., near the village of Commonwealth, has shipped its first ore to Escanaba, and from now until the close of the season daily shipments will be made. Superintendent Hopkins expects to ship at least 50,000 tons. The company is building a large engine house, and making other extensive improvements.

Oglebay, Norton & Co. have commenced work on their property between the Kinney and Buhl mines. They have ore deposits on four forties, and are busy working the surface preparatory to sinking the shaft. It is said that the Duluth, Missabi and Northern Railway Co. will build a spur about four miles to the mine.

Exploratory work has been carried on by the Cleveland-Cliffs Iron Co. on the western end of the Menominee range for a number of months past, and the company has added another property to its holdings in the Iron River district. It is known as the Erickson tract, and diamond drilling is under way there at present. The Erickson is in the same locality as the Blair, Michaels and Schiebler properties, in all of which ore has been found. Work at the Schiebler property is being done by the St. Clair company, of Duluth, which has a diamond drill at work, and five others are being operated by this concern on the Western Menominee. Exploratory work in the Iron River district has shown that the ore bodies extend to much greater depths than have been imagined.

Two million tons of ore, it is expected, will be mined from the Steel Corporation's Norman property in the Virginia district of the Mesabi range, and the whole district is having a particularly busy season. Shipments from the Norman have been greatly facilitated by the building of the new tracks of the Duluth, Missabe and Northern into the pits. Five shovels have been engaged in loading the cars. The Higgins mine, in the same locality, is being operated more extensively than at any time since 1904. The Jones & Laughlin Lincoln property, and the Republic Iron & Steel Co.'s group, are also very active. Rolling stock facilities have been found ample since the 800 new cars of the Steel Corporation were put in operation.

RELATIVE VALUE OF WEEKLY SALES AND SHIPMENTS OF A LARGE STEEL COMPANY DURING THE DEPRESSION.


JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1907
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1908
JAN. FEB. MAR. APR. MAY JUNE JULY AUG.
1909
EXPLANATORY
Weekly Sales Averages (Cumulative) solid line
Weekly Shipment Averages (Cumulative) broken line

CAR SHORTAGE.

Complaints Are Beginning to be Heard on the Ranges.

Mountain Iron, Minn., Aug. 24.—Notwithstanding that the railroads of the Lake Superior iron region have largely increased their rolling stock the past few years, complaints that there is difficulty in obtaining adequate transportation facilities are beginning to be heard. The movement of ore has steadily increased until at the present time it is proceeding at a rate of better than 6,000,000 tons per month. The shipments for the season approximated 15,000,000 tons to Aug. 1, and with indications that the rush will continue until the close of navigation there is little reason to doubt that the year's outgo will closely approach 40,000,000 tons and the outlook for the coming winter on all of the ranges is very promising.

Comment has heretofore been made with reference to the growing popularity of concrete mining shafts in the Lake Superior country. Two new contracts for work of this kind have recently been awarded. One calls for the construction of a concrete shaft at Pickands, Mather & Co.'s Scranton mine, on the Mesaba range, and the other provides for a similar project at one of the properties of the Rogers-Brown interests in the Cuyuna district.

The route of the Cuyuna Iron Range railroad having been definitely decided upon, construction work is now actively in progress and it is predicted that some 40 miles of the road will be completed by early winter. Steel will be laid as far as the Rabbit Lake and Chescuitawney properties this year. Work on the Thief River Falls division of the Soo line is making good headway between Moose lake and Soo junction, extending from which latter point the Cuyuna road will tap the mining country, so that material for the new ore-hauling line should be procured without delay. As the Cuyuna line has been surveyed, it will cross the Northern Pacific railway by an overhead crossing about two miles east of Deerwood and will run nearly parallel with the latter road to the Chescuitawney property.

The Scranton mine, the development of which Pickands, Mather & Co. are now undertaking, will eventually be one of the very largest underground properties on the Mesaba range. It comprises 120 acres, in Section 7, 57-21, and lies just southwest of Hibbing. It is estimated that the tract contains in the neighborhood of 20,000,000 tons of ore. The fee is owned by the state of Minnesota.

Swallow & Hopkins, who formerly operated the Holland mine at Biwabik, are preparing to open the Jennings property, in Section 14, 58-19, one-half mile east of the Kinney mine. The deposit is estimated to contain 1,500,000 tons of ore. The mine will be an open pit producer. The depth of the overburden ranges from 85 to 90 feet. The pit will be a comparatively small one, and contrary to the usual practice of providing an entry way for locomotives and cars, much of the overburden and all of the ore will be taken out by means of inclined shafts and hoisting engines.

Preparations are being made at the Pittsburg Iron Ore Co.'s La Rue mine, at Nashwauk, on the western Mesaba, whereby a portion of the property will be operated on the underground method.

Shipments from stockpile have recently been started at the Cleveland-Cliffs Iron Co.'s Crosby mine, at Nashwauk, and it is expected that all of this reserve ore will be forwarded to the lower lakes this season. The stockpile is one of the largest on the Mesaba range. The ore is being taken out over the Great Northern railroad. The new Nashwauk-Grand Rapids extension of the Great Northern is practically completed between Nashwauk and Bovey, near Grand Rapids, with the exception of the big steel bridge over the approach to the Steel Corporation's Canisteo mine, and it is expected that trains will be running over the new line within a week or two.

The Steel Corporation's big new Walker pit, in the Bovey-Coleraine district, has entered the shipping list, and just now it is making a heavy production, from 50 to 100 cars being forwarded daily. The ore which is being taken out is of the better quality, that which does not require washing,

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Preparations have been made for the removal of the American Metal Door Co. from Jamestown, N. Y., to Bradford, Pa. The city council of Bradford has voted a tax exemption for the first year the company is in Bradford, and a board of trade committee was appointed to raise funds to move the workmen employed by the company to the new location. The company now has contracts to supply the Peabody National Museum, Washington, D. C., with doors and windows, and for windows and doors for a school in Collinwood, O.

MONTEREY STEEL PLANT

May Be Taken Over By Prominent European Interests.

[The Monterey iron and steel plant referred to in the following letter is the one described in recent press dispatches as having been very heavily damaged by floods.]

City of Mexico, Aug. 26.—It is authoritatively known here that representatives of the great European iron firms of Creussot of France and Cockeril of Belgium have been in Mexico with the view of furthering negotiations with the government for the acquiring of the Monterey iron and steel plant and the establishment of extensive works in Mexico for the manufacture of iron. The government has a large interest in the Monterey plant by reason of many special concessions granted and as a creditor for 10,000,000 pesos loaned to further the enterprise. The Monterey plant has never been profitable and only recently has had the advantage of an almost prohibitive tariff on certain iron and steel products. Also the government owned railroads were influenced to give the plant a large rail contract. The plant is said to be poorly constructed and the conditions for successful large operation are said not to be good. The bonusing of this plant is part of the obvious policy of the Mexican government to be independent of the United States in the manufacture of materials that might be needed in the case of a war as is also evidenced in the dynamite monopoly. It is likely that the government would be willing to sell to some European country and to insure to such a purchaser the fostering of the government which has so far been necessary for the business. At any rate the representatives of these large companies have investigated the Mexican field and have been in conference with the government over the situation. The government is also fostering the plans for the interesting of European capital in the Oaxaca iron propositions.

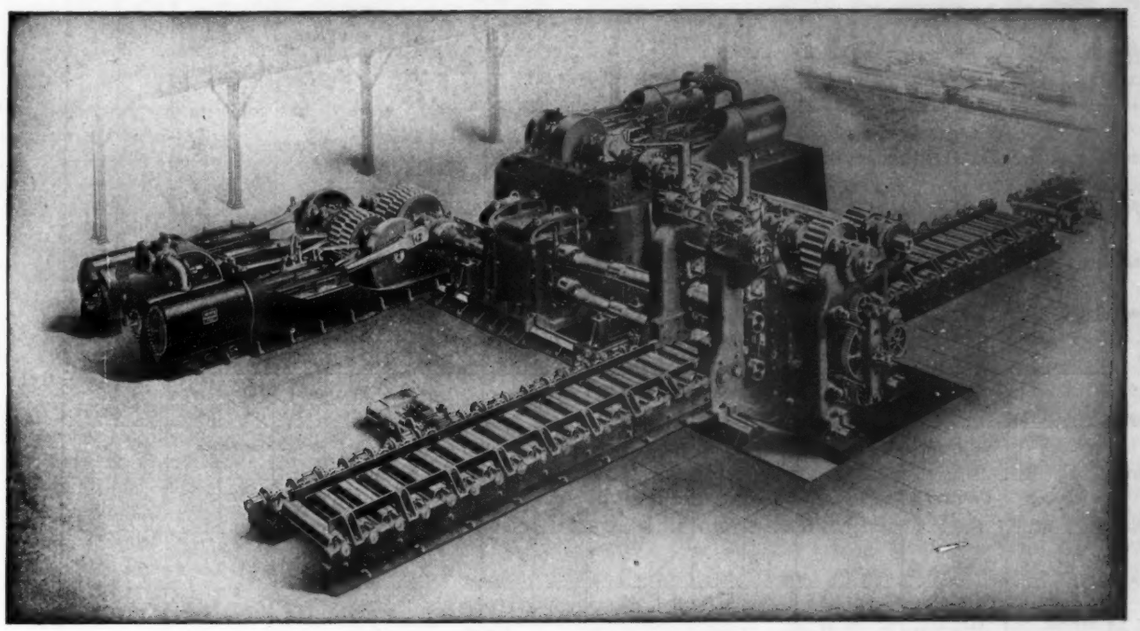
As a preliminary to the plan of the Monterey company to use nothing but Mexican coke instead of dividing its patronage between the native and imported product in equal shares, the Sambinas Coal Co. has placed an order for coke ovens in Belgium. Sixty ovens will be installed. Another order for 30 ovens was placed recently by the Lampacitos Coal Co. and the Mexican Coal & Coke Co. is now installing 30 ovens at Las Esperanzas. The present Mexican production of coke is about 16,500 tons a month, which will be increased to 28,500 tons when the new ovens are all working.

POWER REQUIRED FOR ROLLING MILLS

Method for Determination of Most Economical Size of Power Generator for Rolling Mills

By J. A. Knesche.

In many cases, perhaps in nearly all cases, a great deal of guessing is done when it is necessary to determine the size of an engine which is intended for rolling mill work. Up to within recent time no accurate data were available on the power requirement for such work because no systematic investigations had been made. While special investigations had been made in individual cases, the results were invariably applicable only to the particular installation then under consideration.



Forty-Inch Slabbing Mill Driven By 46 x 60-Inch and 36 x 48-Inch Reversing Engine. Built by Mesta Machine Co.

A Common Problem.

The purpose of this article is to propose a better and more scientific method of determining the power required for rolling mill work; a method which may be applicable to the rolling of all kinds of steel products. The problem usually presented is that of choosing the most economical size of engine or motor for a certain predetermined type of mill which is to produce a certain tonnage per unit of time. For the purpose of showing the author's method of determining the proper size of the motive power for the mill the following case is worked out: Given a 21-inch plate mill with roll arrangement made up of three-high roughing rolls, three-high planishing rolls and two-high finishing rolls, with rapid driven tables and conveyors and such furnace capacity as to assure a supply of hot steel as fast as needed. The material rolled shall be skelp steel of 0.07 carbon and the finished product shall be 13.62 x 0.105 inches. The steel shall be taken to the roughing rolls in blocks of 2¾ x 12⅞ x 26¼ inches. The engine is to be direct-connected and is to drive all three stands of rolls. The mill is to have a capacity per 24 hours of 400 gross tons and everything belonging to it is to be so arranged that serious accidents and long delays cannot occur under ordinary conditions of operation. The problem now is: "What power should be developed in the engine cylinder and what should be the demand for power on the flywheel during the regular mill cycle of this product in order that the engine operate most economically?"

The Most Economical Engine.

The operation of an engine in rolling mill work is most economical from every point of view when that engine runs most of the time at or near its normal full load for which it was designed. By this is meant the development of the normal rated power of the engine in the engine cylinder under normal speed at from 1/4 to 1/3 cut-off. If we now design the engine for the average actual horsepower requirement in the rolling of the product in question and let the excess over this average actual horsepower be developed in the flywheel through a proper speed reduction we will have the most economical engine with respect to power. This article will not consider the question of the most economical type of engine from the standpoint of upkeep. In a mill with a number of different engines doing similar work and with a first-class accounting department, the cost of repairs is easily arrived at and after due consideration of the other factors which have to be considered in the choice of the proper type, such as simplicity of design, delays in the operation of the roll train and their frequency of occurrence due to engine breakdown, it should not be difficult to make a judicious choice. We will therefore specify an engine which at normal speed shall be able contin-

uously to develop the average actual horsepower required for the rolling of the product in question, with a flywheel sufficiently heavy to take care of the peaks of the mill cycle by a drop in speed, which is not to exceed a certain limit.

Data for Tonnage and Power Computation.

The total output of the mill, or rather the rolling capacity of the mill, is to be 400 gross tons per 24 hours of the product already mentioned. In order to produce this tonnage, allowing for a waste of 4 per cent in the re-heating furnace, we find that

3,540 of such billets would have to be rolled. If we figure 10 per cent of the total time for unavoidable delays and accidents we reduce the actual time of rolling to 21.6 hours.

In order to compute the power required for rolling we are given the following data, part of which has already been mentioned:

Dimensions of billet, 2¾ x 12⅞ x 26¼ inches.
Dimensions of final section, 13.62 x 0.105 inches.
Number of passes, 8.
Average starting temperature, 2,540 degrees Fahr.
Average finishing temperature, 1,550 degrees Fahr.
Lineal speed of roll surface per second, 6 feet.

The intervals between passes are to be as follows, due allowance having been made for transfer from one stand of rolls to another:

3 seconds between first and second passes.
2 seconds between second and third passes.
2 seconds between third and fourth passes.
2 seconds between fourth and fifth passes.
3.5 seconds between fifth and sixth passes.
2 seconds between sixth and seventh passes.
4 seconds between seventh and eighth passes.

Reduction and Horsepower Computations.

The reductions are not given; they are to be figured. Since there are eight passes only, and further, since the first few passes will be of comparatively short duration, the power requirements for these first passes can be higher than for those of the last few, because ordinarily the flywheel will make more power available during the short than during the long passes. Consequently, we can choose the reductions in such a way that the demand for power during the first passes be greater than during the last passes. This is precisely accomplished in the present case by using a reduction expressed in percentages equal to the average. Whether the ratio of maximum to minimum load during the different passes will be such as to give a low average load on the engine will appear later. Accordingly, the average reduction becomes

$$100\left[1-\log.\left\{\frac{1.43}{35.406}\right\}^{1/8}\right] = 33.05 \text{ per cent.}$$

in which 1.43 equals the area of the final section of the product in square inches and 35.406 equals the sectional area of billet in square inches.

The writer's formulae for determining the horsepower for the different passes are as follows:

$$\frac{C_1 L_1 (A_b - A_1)}{550 s_1} = \text{horsepower for first pass.}$$

$$\frac{C_2 L_2 (A_1 - A_2)}{550 s_2} = \text{horsepower for second pass.}$$

$$\frac{C_3 L_3 (A_2 - A_3)}{550 s_3} = \text{horsepower for third pass.}$$

etc.

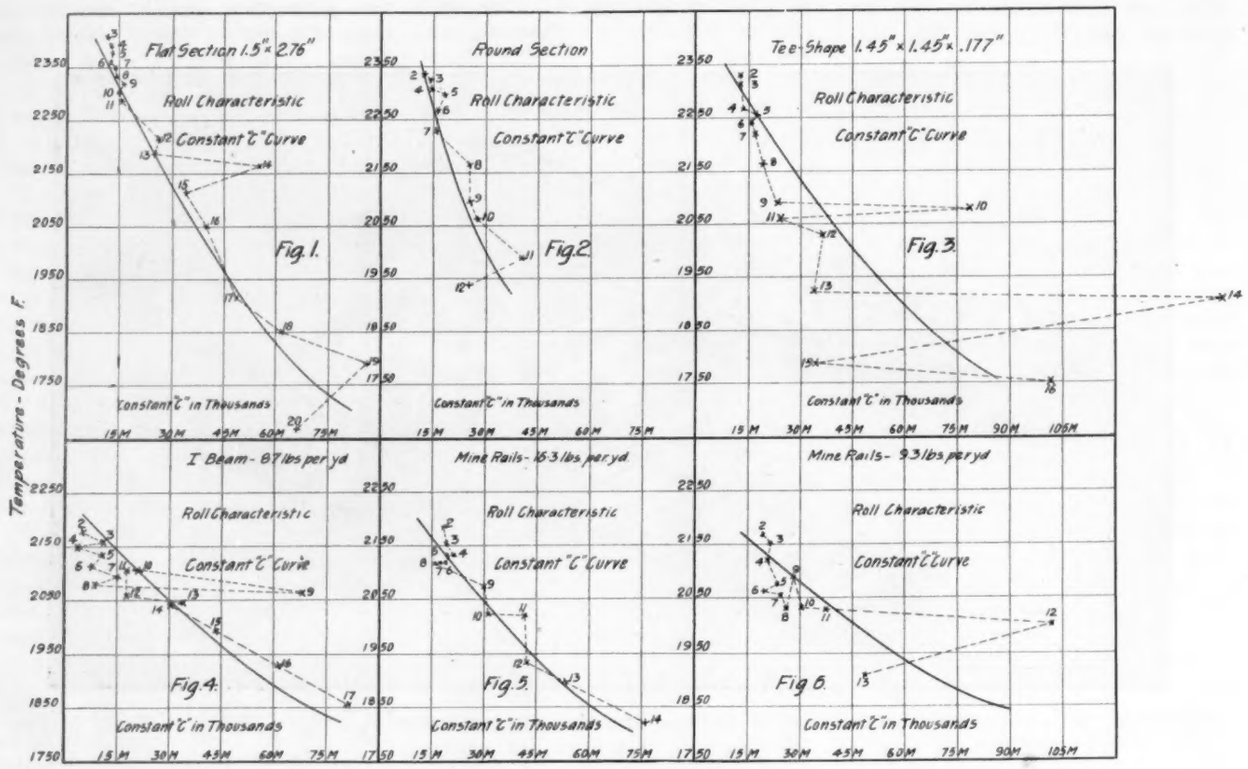


CHART SHOWING CHARACTERISTIC CURVES.

Where C_1, C_2, C_3, etc. = the work reqired per square inch reduction per foot length of piece after first, second and third passes, etc., at certain temperatures and for the sake of brevity called constant C in this article.

L_1, L_2, L_3, etc. = lengths in feet after first, second and third passes, etc.

A_1, A_2, A_3, etc. = sectional areas in square inches after first, second and third passes, etc.

A_b = sectional billet area in square inches.

s_1, s_2, s_3, etc. = duration of first, second and third passes, etc., in seconds.

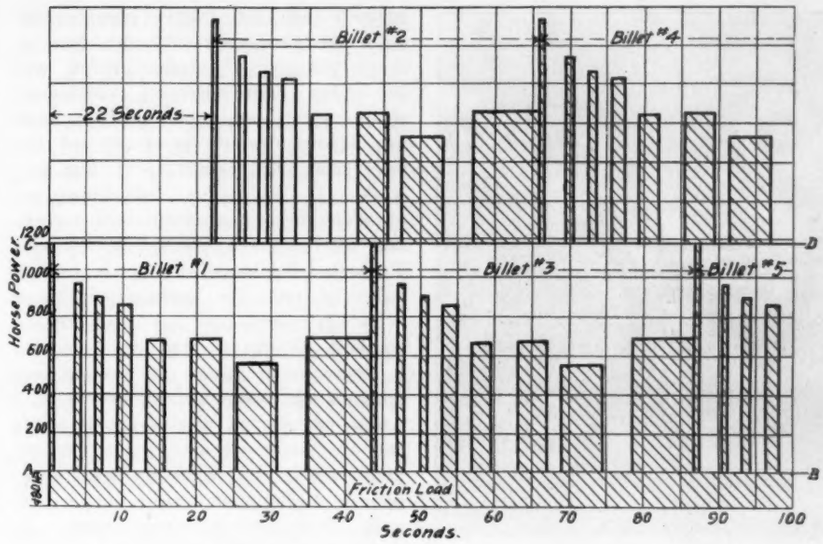


FIG. 7—DIAGRAM SHOWING RELATIVE POWER REQUIREMENTS.

Constant "C" is determined by careful experiments and equals

$$\frac{W}{R\,L}$$

Where W = Actual total work required for the pass in question not including friction load;

R = Reduction expressed in square inches for the pass in question, and

L = Length in feet of the material after pass in question.

In the problem worked out in this article the constant C curve as given in Fig. 1 has been employed. This curve, as well as all the other curves in Figs. 2, 3, 4, 5 and 6, have been plotted from the best data available at the present time, namely, the experiments conducted by J. Puppe, engineer for the Verein Deutscher Eisenhuettenleute. The author conducted a series of experiments along exactly the same lines in 1906 and 1907, where all the measurements except temperatures were made with painstaking care. These tests show a remarkable coincidence with those of J. Puppe, but since in the author's experiments the temperatures were estimated by color because no suitable pyrometer was available, it was deemed best to use only data no part of which had been estimated.

Some time after the writer had made his first series of tests he developed a constant "C" curve which he thought could be used for the determination of the power requirement of any mill, no matter whether bars, structural shapes or rails were rolled. The writer's tests were made on flat sections where the lateral displacement during rolling was practically insignificant. However, when structural shapes, rails, etc., are rolled the lateral displacement of the steel, together with the considerable side friction in the pass, absorbs a great deal of energy without bringing about any considerable reduction in area, and therefore constant "C" which is the work required per square inch reduction per foot length of piece will be greater than if a less complex section were rolled. This greater power requirement in a shape with large lateral displacement is strikingly illustrated in Figs. 3, 4, 5 and 6 when compared with Figs. 1 and 2. The solid line in Fig. 1 is the constant "C" curve for a flat section and in Fig. 2 for a round section; in the rolling of these flat and round sections the movement of the steel is practically all in a forward direction. The other figures represent more complicated shapes; Fig. 3 is the curve for a T-shape; Figs. 5 and 6 for mine rails, and Fig. 4 for an I-beam. It is very noticeable from the general directions of the curves that these last shapes require more power than those of Figs. 1 and 2. From these curves it is also very evident that one curve cannot be used for all kinds of shapes.

The dotted lines represent the actual curves which the accurate data of the German tests yield. It is, of course, easy to see that in the determination of the power for the different passes the broken line curves cannot be considered, but that the average curve (constant C curve) shown in each case must be taken. The broken lines in Figs. 1, 2, 3, 4, 5 and 6 may be called the "characteristic curves" of the roll passes employed in the rolling of the shapes in question. These "characteristic curves" will remain practically the same for the given set of rolls.

It would, of course, be impracticable to figure the power requirement for the different passes from these irregular-shaped curves (characteristic curves), because it will always be desirable to do the required work with the least possible expenditure of energy, and if this can be done the characteristic curves will be nearly as smooth as the constant C curves. Further, it might be necessary to roll the shape in question in more or less passes than were employed when that shape from which the characteristic curve is plotted, was rolled. In such an event the characteristic curve would give inaccurate results.

That it would not be advisable to

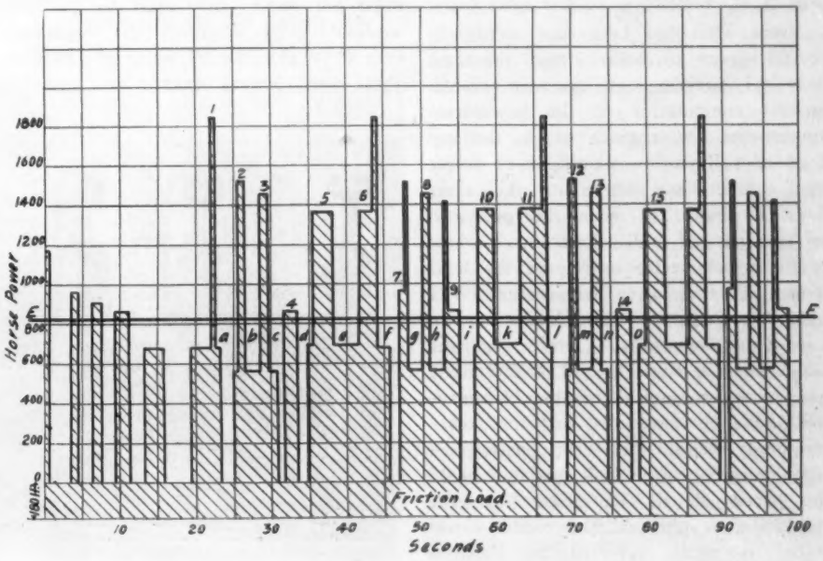
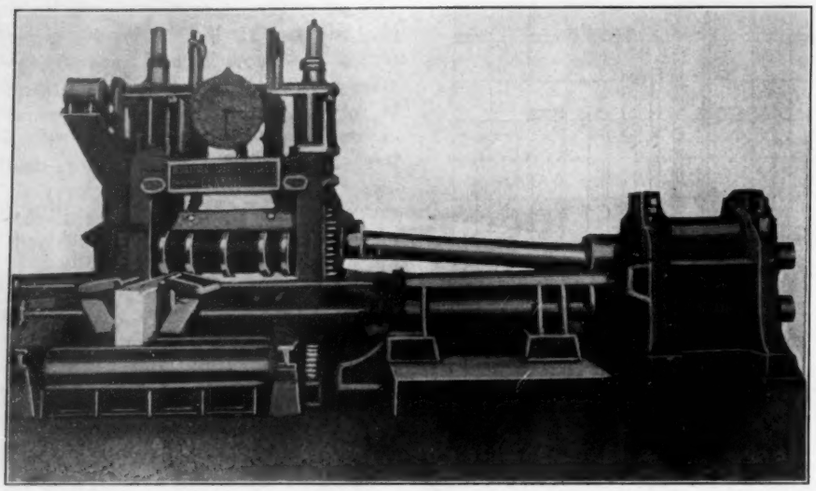


FIG. 8—DIAGRAM SHOWING COLLECTIVE POWER REQUIREMENTS.



Blooming Mill With Hydraulic Manipulator.

base power requirements for the different passes on the characteristic curve is illustrated further in a pronounced way in Figs. 5 and 6. Constant C curve in the twelfth pass in Fig. 6 is 101,600 rolled at a temperature of 1,996 degrees Fahr., while constant C in the same pass in Fig. 5 is 40,300 rolled at a temperature of 1,942 degrees Fahr. This contrast in constant C is significant; it means that a reduction of each square inch for a length of one foot in the twelfth pass required 101,600 foot pounds of work at a temperature of 1,996 degrees Fahr. in Fig. 6, while for the production of the same effect in the same pass in Fig. 5 there was required only 40,300 foot pounds of work at a temperature of 1,942 degrees Fahr. In either case there were rolled mine rails of practically the same material; the fact that in Fig. 6 the finished rail was lighter than the finished rail in Fig. 5 is immaterial to the question.

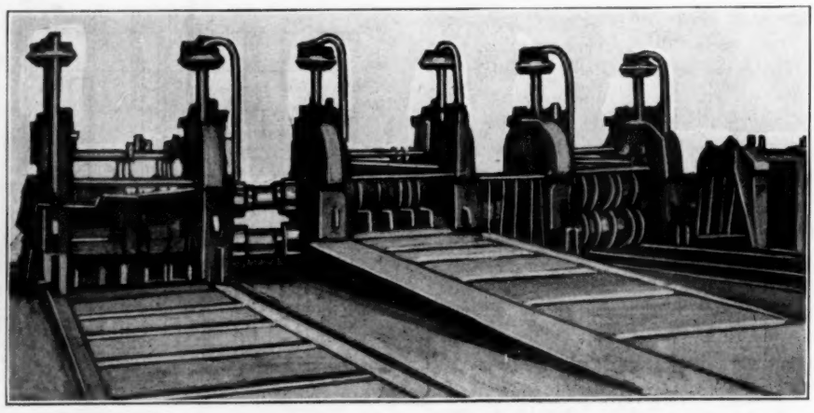
From what has been said so far it would seem to follow that the best way of arriving at accurate results in the computation of the power requirements for engines or in the design of roll passes, would be to select the characteristic curve of the same finished shape for which computations or designs of roll passes are to be made, which seems to require the least power at the lower temperatures. If then a smooth averaging line is drawn into this characteristic curve (see the solid lines in Figs. 1, 2, 3, 4, 5 and 6) the most economical constant C curve will have been obtained and the power required for the different passes and the design of the roll passes should be based on it. To prove that the foregoing is practical the reader interested is again referred to Figs. 5 and 6, which show economical and uneconomical characteristic curves respectively; here the same kinds of shapes were rolled in both cases.

One more question comes up which should be touched upon before we leave this interesting subject. The question is: would it be practical under the usual mill conditions to limit the power of the engine to the most favorable roll pass design, or, what is the same thing, to the most economical power requirement for the different passes? What, for instance, if the roll pass design is such as not to give the greatest economy in engine power? What, for instance, if the engine has been designed for the most economical characteristic curve and that after a set of rolls has been turned up, the characteristic curve for the rolls in question is found to be similar to the characteristic curve in Fig. 3? The answer to these questions is, of course, that gross errors in roll pass design must not occur; they must be guarded against. And wherever the organization in a plant is of such a character that these errors cannot be guarded against, then the engine simply must work uneconomically and the cost of steam per ton of product rolled will be higher than necessary. However, at this point should be called to mind the definition given previously of the most economical engine for rolling mill work. If an engine, the dimensions of which have been determined according to the most economical constant C curve, should be used for driving a set of rolls the characteristic curve of which would give a less economical constant C curve than the constant C curve from which the engine was designed, it would simply work at a longer cut-off and to this extent would call for more steam. Hence this engine would cease to be the most economical rolling mill engine in accordance with our definition, while yet it might be able with its longer cut-off to drive the roll train and do the work.

Return to Previous Problem.

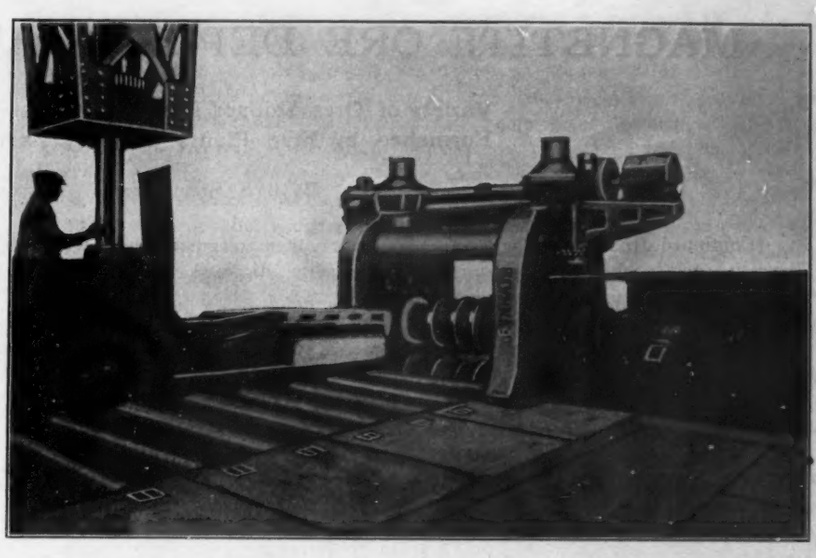
But we have digressed from the problem as outlined and we will now return to it. The billet which is to be rolled in the mill for which we are to determine the size of the engine is to receive five passes in the roughing rolls, two passes in the planishing rolls and one pass in the finishing rolls. All data for working out the horsepower for the different passes are given in Table 1. The constant C curve in Fig. 1 of this article has been used for the reason already given.

At this point something should be said about the item "average drop in temperature per second." No doubt there will be some, perhaps many, who will hold that this method of arriving at the proper temperature for each pass is approximate only. The writer concedes this and frankly admits that he knows at present of no better method. In working out this drop



Direct Driven 27.5--Inch Mill.

in temperature the assumption is made that the rate of cooling is the same for all the sections of the different passes, no allowance being made for the many other conditions influencing the rate of cooling, such as the temperature of the atmosphere; the temperature and the quantity of water running on the rolls; heat lost while sections are in contact with the iron plates of the hot bed; different rates of cooling because of different sectional areas, etc. However, the writer thinks that these conditions are not of sufficient importance to warrant the introduction of co-efficients different for each case and difficult to determine. These are minor questions only and can be left out without detracting from the practical value of the results. Given in very small sections, such as occur in thin plates, when during the transfer from one pass to another the steel remains in contact with the comparatively cold plates of the hot bed for a greater period of time than is usual, it seems best to use the average drop of temperature per second only, rather than to introduce uncertainties that might lead to serious errors.



BLOOMING MILL WITH ELECTRIC SCREW-DOWN AND INGOT CRANE.

Table I.

SLIDE RULE COMPUTATIONS.

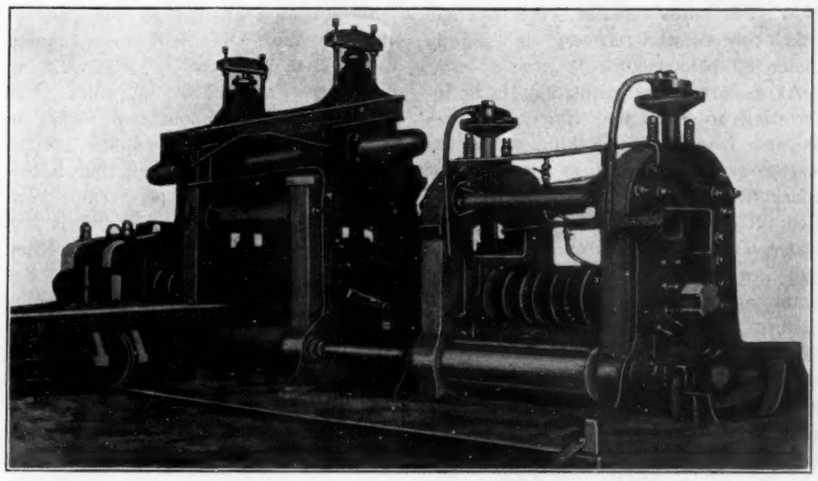
Horsepower required in rolling a plate 13.62 x 0.105 inches by 52.05 feet from a 2¼ x 12⅞ x 26¼ inch billet:
Average starting temperature, 2,450 degrees Fahr.
Average finishing temperature, 1,550 degrees Fahr.
Total time in seconds required for rolling, 43.48.
Average drop in temperature per second, 21 degrees Fahr.
Average roll speed per second, 6 feet.

	No. of Pass 1.	2.	3.	4.	5.	6.	7.	8.
Area in square inches	23.75	15.90	10.67	7.15	4.78	3.20	2.24	1.43
Reduction in square circles	11.65	7.85	5.23	3.52	2.37	1.58	0.96	0.81
Length in feet	3.19	4.68	6.99	10.04	15.57	23.27	33.25	52.00
Duration of pass in seconds	0.52	0.78	1.17	1.73	2.70	3.88	5.55	8.65
Interval between passes in seconds	3	2	2	2	3.5	2	4	
Pass plus interval in seconds	3.52	2.78	3.17	3.73	6.20	5.88	9.55	8.65
Calculated drop in degrees Fahr. during pass plus interval	74	58	67	78	130	124	200	182
Average calculated temperature when rolling in degrees Fahr.	2,450	2,376	2,318	2 251	2,173	2,042	1,919	1719
Constant C	9,000	11,200	15,800	21,000	27,000	39,000	51,000	78,000
Horsepower required for rolling minus friction load	1,170	962	900	860	670	673	536	691

Graphical Representation With Explanation of the Work.

Since time, power, billets, passes and intervals must be kept in mind so that their relative and collective effect can be determined at all times during this investigation, and further, since the eye is more sensitive to form than the mind is to numbers, the mill cycles of these billets are now presented in graphical form in Figs. 7 and 8. The diagrams in Fig. 7 show clearly in a pictorial sense the power required for each pass, the relative power requirements for the different passes and also the intervals between the passes. The diagram in Fig. 8 shows the conditions existing during the entire mill cycle, which are mentioned in the preceding sentence, and also the collective power requirement at any instant.

In these diagrams the durations of the passes and intervals are plotted as abscissae, while the power requirements for the different passes are plotted as ordinates. Fig. 7 is shown because Fig. 8 is evolved out of it. In constructing these diagrams the ordinate of the line AB in the lower portion of Fig. 7 represents the horsepower required for the friction load plotted to a suitable scale. The friction load depends, of course, on the type of mill and has to be determined by tests on a similarly arranged mill. From a number of tests made, such as are considered in this paper, this friction load was taken at 180 horsepower. This is an ever-present quantity and therefore the passes are plotted upon it, using the data furnished in Table 1. In order to make the tonnage required under the given conditions a finished plate must come from the mill every 22 seconds, as already stated.



REVERSING MILL FOR ROLLING ROUNDS UP TO AND INCLUDING 2-INCH.

(To be continued.)

MAGNETITE ORE DEPOSITS AT MINEVILLE

Variety of Ores Shipped From Workings—Power Furnished by Five Plants—Testing Laboratory

By B. S. Stephenson.

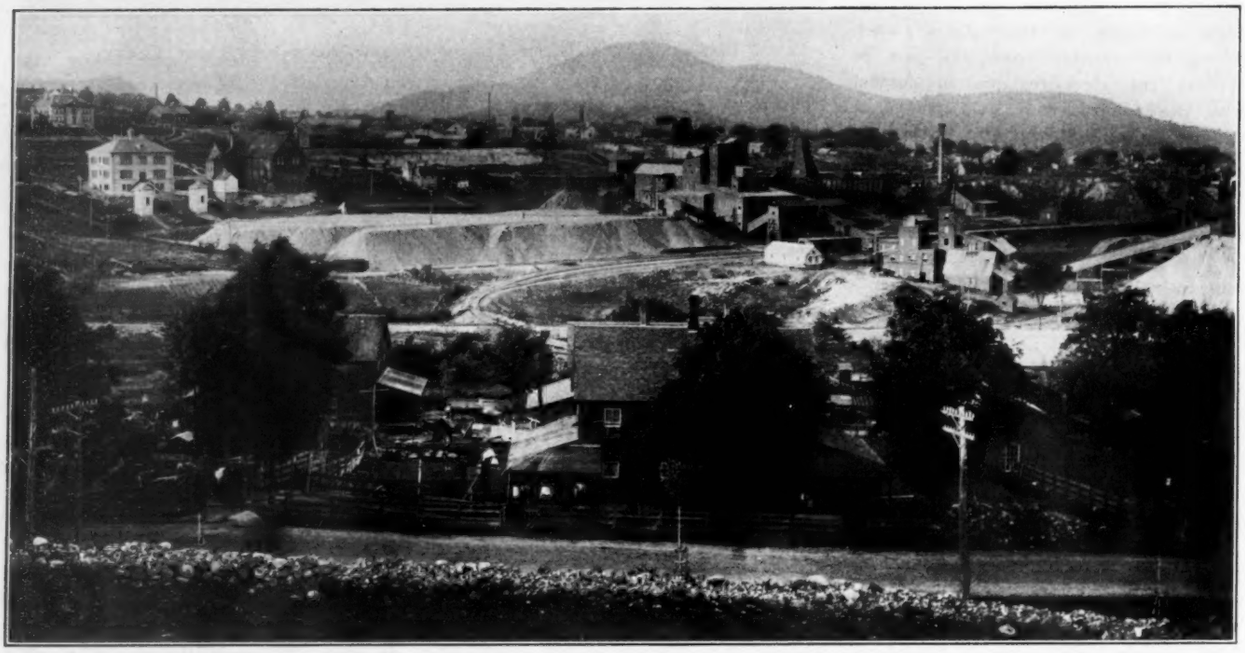
(Continued from last issue.)

Beneath each pocket of the storage bin is located a magnetic separator, principally of the Ball & Norton type, from which the heads go direct to the shipping bins and the tails, containing apatite, hornblende, some silica rock and considerable iron, are sent up for re-treatment. Another belt separator recovers a part of the iron concentrates, which is conveyed to the shipping bins, and the resulting tails then pass through a set of 32 x 10-inch high speed finishing rolls, shelled with chrome steel and running 300 revolutions per minute, after which they are carried to a tower screen equally divided between 16 and 10-mesh, beneath which are two Wetherill Type E separators. These first remove the iron and pass it on to the shipping bins through another Ball & Norton belt separator. From the Wetherill machines the hornblende is a middlings product which passes off as mill tails, containing sufficient apatite to give it considerable value as a fertilizer. The apatite concentrates, carrying up to 65 per cent of bone phosphate, form the tails from the Wetherill separators, because of their magnetic character, and are readily disposed of to fertilizer plants.

Out of the 800 tons of crude Old Bed ore which can be treated in 10 hours by Mill No. 2, about 85 per cent, or roughly 680 tons, is recovered as iron concentrates, the first and second grade apatite concentrates running about 60 tons each. Of Harmony and New Bed ores treated, the average iron concentrate recovery is slightly under 80 per cent.

As a sort of recapitulation, it is interesting to note the variety of ores shipped from these workings either as selected crude ore or as products of concentration. What is known as "Old Bed 21" lump ore, averaging slightly above 60 per cent in iron, high in lime and low in silica, is a selected large lump almost universally employed by eastern puddling mills and basic open hearth plants. "Old Bed 21" furnace ore is also in crude form and is almost identical in analysis, but is prepared for blast furnace use by crushing and screening; it is high in phosphorus and practically self-fluxing. The standard Old Bed concentrate prepared for furnace use, is also nearly self-fluxing and is free from fines and dust. A typical analysis, by A. S. McCreath & Son, Harrisburg, Pa., is as follows:

Iron	65.84
Phosphorus	0.72
Silica	3.02
Manganese	0.062
Alumina	0.92
Lime	2.36
Magnesia	0.53
Sulphur	trace.
Moisture	none



General View of Mineville. Concentrating Mills and Tailings Near Center of Picture. Offices, School and Memorial Hall.

Somewhat coarser than the concentrates is the "Old Bed" ore, running about 63.00 per cent in iron, 1.18 in phosphorus and 3.50 in silica; the largest pieces are about two inches in diameter. The Harmony cobbed ore has about the same iron content, but is low in phosphorus (0.103 per cent), contains over 9 per cent silica and is low in lime. Rejections from the cobbing machine, without further crushing, are sold as Harmony middlings, running about 40 per cent in iron, 28 in silica and 0.2 in phosphorus. For special open-hearth use and electrical purposes, Old Bed and Harmony concentrates of extremely high iron content can be secured. When it is considered that the pure mineral carries only 72.41 per cent iron, the remarkable nature of

these concentrates can be understood from the following typical analysis:

	Old Bed.	Harmony.
Iron	70.00	71.00
Phosphorus	0.28	0.017
Silica	0.95	1.80
Alumina	0.33	0.20
Lime	1.38	
Magnesia	0.15	

In addition, as a by-product from the concentration of high phosphorus ores, what is known as No. 2 phosphate tailings are secured and are largely employed by blast furnaces whose regular mixture is deficient in phosphorus. This product contains 8 to 10 per cent of phosphorus, about 38 per cent of silica, 7 per cent of alumina, 26 per cent of lime and 4 per cent of metallic iron. A similar product and employed for the same purpose is what is termed No. 3 phosphate tailings, which contain about 15 per cent of iron and about 6 per cent of phosphorus. The Harmony tailings, suitable for concrete use, and pulverized apatite, valuable as a fertilizer, are referred to elsewhere.

Power Plants and Equipment.

The power equipment of the Mineville workings is particularly noteworthy because of its magnitude and the important additions recently made. The power house at Port Henry, from which current is conveyed five miles overland to the mines, was completed only recently; it is a concrete structure, built from Harmony tailings, is located on the shore of Lake Champlain and is fitted with Curtis turbogenerators. For the following complete information concerning the entire power equipment at Mineville and Port Henry, we are indebted to H. Comstock, electrical engineer of the company.

The total power used at the various mines, mills, shops, etc., is furnished by five plants. Two of these are water power plants and the other three are steam.

The two water power plants are owned by D. F. Payne of Wadhams Mills and are known as the "Kingdom" plant and "Wadhams" plant. The Kingdom plant obtains its water from Lincoln pond, which is situated about six miles north of Mineville and receives the drainage of about 17 square miles of territory. The power house is a wood structure with concrete foundations and is located 6,000 feet east of the pond. The water is led from a concrete dam at the lower end of the pond through a 32-inch steel penstock to the power house.

The installation consists of a 375-kilowatt, 6,600-volt alternator, direct connected to a Pelton water wheel operating under a head of 316 feet at 500 revolutions per minute. The excitation is furnished by an 11-kilowatt, 125-volt exciter belted to the alternator shaft. The power from this plant is transmitted at 6,600 volts eight miles to Central power house in Mineville.

The Wadhams plant is situated about six miles east of the Kingdom plant on the Black river and the water is obtained by means of a dam across the river. The water from Kingdom also discharges into this river. The power house is similar in construction to the one at Kingdom and contains a 300-kilowatt, 5,600-volt alternator, belted to a turbine wheel. The turbine operates under a 48-foot head and is supplied through a penstock 54 inches in diameter and 380 feet long. The exciter is a 7½-kilowatt generator belted to the main shaft.

The power is transmitted nine miles at 6,600 volts to Smith mine, which is two miles north of Mineville. Here the voltage is stepped down to 3,300 volts by oil cooled transformers connected in delta. From here the line runs to the central power house in Mineville.

The total output from these two plants is used at the mines and under normal conditions averages about 700 horsepower.

Central Power House.

Central power house is located in the western part of Mineville and is so-called on account of its position with regard to the ore bodies. The building is a rectangular brick structure with steel roof trusses and corrugated iron roof. The whole building is fireproof throughout.

The boiler room contains three Geary water tube boilers with 45 square feet grate surface each. The feed water is heated in an open type feed water heater and is supplied to the boilers by an independent plunger type steam pump. A good grade of bituminous coal is burned with hand firing.

The stack is of unlined steel 7 feet diameter, 110 feet high and is self-supporting. It is connected with the boilers by an overhead rectangular steel smoke breeching 65 x 84 inches.

The engine room is 44 feet 6 inches by 52 feet and the floor is raised 8 feet 6 inches above the boiler room floor. All the engine auxiliaries except the exciter and switchboard are placed below the engine room floor. The generating apparatus consists of a horizontal cross compound condensing engine with cylinders 23 and 46 inches diameter, 48 inches stroke, direct connected to a fly-wheel type alternator rated at 750 kilowatt at 94 revolutions per minute, 3,300 volts. The exciter is a direct current generator belted to the alternator shaft.

The condenser is of jet type with air pump 32 x 14 inches. The steam end of the pump projects above the engine room floor so that access may be had to its valves.

Positive lubrication is provided by a gravity oiling system. The discharge from the bearings flows by gravity to a filter and from the filter the oil is then pumped up into a reservoir from which the oilers are supplied.

The coal used is taken from the Lake Champlain & Moriah Railroad by means of a timber trestle which has a coal bin underneath of 1,000 tons' capacity. By means of a tram car and track which is 8 feet above the boiler room floor, the coal is delivered from the bin to the boiler room within reach of the fireman. The track passes over a platform scale and all coal used is weighed.

The three transformers for the Kingdom line are single-phase type, oil-cooled, connected with primaries and secondaries in delta. The transmission voltage around the works is 3,300 volts and these transformers step the Kingdom voltage down from 6,600 to 3,300 volts.

The transformer house joins the main building and is made of monolithic concrete. This addition contains the above transformers and also the lightning arresters and air-brake disconnecting switches for the Kingdom line. The arresters are of the graded shunt multigap type.

Old Bed Power House.

The Old Bed power house is of brick similar in construction to central power house. It is situated in the central part of Mineville between the Joker and Bonanza shafts. The coal is delivered by a timber trestle and coal pocket with tram car and track arranged similar to the equipment at central power house.

The boiler room contains three water tube boilers, working at 110 pounds pressure.

The engine room equipment consists of a tandem compound Corliss engine rated at 200 horsepower and belted to a 150-kilowatt direct current generator, 250 volts, 550 revolutions per minute. This generator supplies power for two electric locomotives in Joker mine and for various small motors about the works.

The electric lights for the office, mines, mills, shops, and various dwellings are furnished by a motor-generator set consisting of a 440-volt induction motor and a 35-kilowatt, 125-volt

direct current generator, running at 1,500 revolutions per minute. A motor generator set is also held in reserve for supplying current to mines.

The hoisting apparatus at this plant is steam operated and is controlled from the floor of engine room. The hoists are double drum type with 8-foot drums and a capacity of 1,200 feet of 1⅛-inch cable. The clutches are operated by air, but hand and foot levers are also provided. The engines are of standard double Corliss reversing type, 16 x 36 inches.

The signaling system consists of 18-inch gongs actuated by electric switches on 110-volt direct current circuit. The switches are enclosed in water-proof iron boxes and are made of heavy material. They are operated by a cord with handle similar to the ordinary manually operated bell pulls.

A barometric condenser is used for the engines and the circulating water is pumped from a small pond against a head of 100 feet. A combined air pump and jet condenser is used in connection with the generator engine mentioned above.

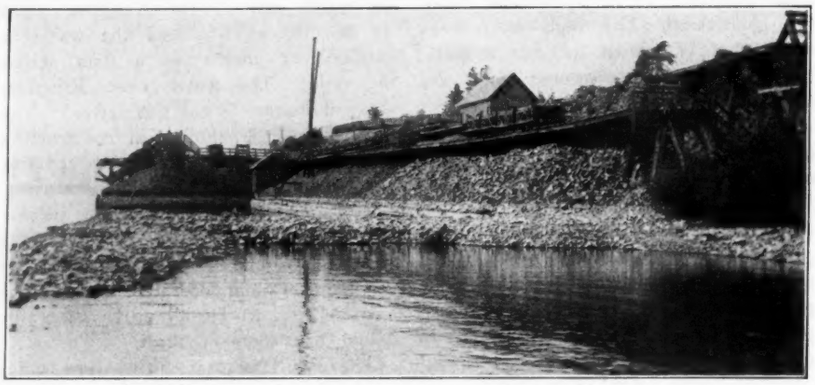
In this building is also located a 2-stage air compressor of 1,750 cubic feet capacity connected to a compound condensing engine and another of 1,220 cubic feet capacity, belted to a 200-horsepower, 440-volt motor, running at 500 revolutions per minute.

Port Henry Power Plant.

The Port Henry power plant is located at Port Henry and is a modern type of steam turbine station. The building is situated on the shore of Lake Champlain and rests on a solid block of concrete. The entire building and chimney are of concrete made from the tailings of the mills. The monolithic style of construction is used for the building and the stack is of reinforced concrete.

The boiler room contains four water-tube boilers rated at 26 horsepower each and two rated at 400 horsepower, giving a total capacity of 1,864 horsepower. The boilers are equipped with superheaters of sufficient capacity to superheat the steam 100 degrees and thermometers are placed in the cross pipes for measuring the amount. At the present time, birdseye coal with hand firing and natural draft is used. McClave sectional shaking grates are used under three of the boilers and flat pin hole grates under the other three. A system of forced draft will be installed later.

The coal is brought in from the main line of the Delaware & Hudson Railroad on a trestle built of wood on concrete bents. The grade of the trestle is such as to give a large dumping capacity underneath the track. Bottom-dump cars deliver the coal onto a concrete floor and from here the coal is wheeled in barrows to the boiler room floor.



PORT HENRY ORE DOCKS, LOOKING SOUTH. ABOUT 1 MILE OF LAKE FRONTAGE IS OCCUPIED.

The stack is 175 feet high by 8 feet inside diameter. The boilers are divided into two sections and the stack is placed between them. A rectangular sheet iron breeching placed back of the boilers connects each section with the stack.

The engine room is 38 feet 4 inches x 52 feet 7 inches and the turbine equipment consists of one vertical 800-kilowatt turbine operating at 5,600 volts and one 1,500-kilowatt turbine, also vertical, operating at 6,600 volts. Both machines are controlled by hydraulically operated governors and oil step bearings are used; 165 pounds steam pressure and 100 degrees superheat is used on the two main turbines.

The condensing apparatus is of the surface type and maintains a vacuum of 28 inches. The circulating pumps are centrifugal and are direct connected to vertical high speed engines. The air pumps are also of the vertical type and deliver the water of condensation through a stand pipe to the heaters, which are of the open type.

The excitation for the turbines is furnished by a 35-kilowatt induction motor generator set and by a 35-kilowatt horizontal turbo-generator, either of which is large enough to supply both generators. A 20-kilowatt turbo-generator of same type furnishes light for the building and grounds.

The switchboard is placed on a concrete gallery which is 9 feet from the engine room floor and runs the full length of the room. The cells for oil switches, transformers for motor generator set, exciters and all high potential wiring is placed underneath this gallery. The switchboard is made up of an exciter and regulator panel, two generator panels, and two line panels.

A 30-ton crane in the engine room is capable of handling the heaviest piece of apparatus. The piping in both engine and boiler room below the floor line is run in concrete trenches fitted with cast iron cover plates.

Current Transmission and Distribution.

A double transmission line of bare copper wire runs from here to Mineville. These lines run from the power house to a small concrete house containing the lightning arresters. This house is similar in construction to the main building. At Mineville the lines run through a second set of arresters of the same type as the ones at Central power house and into a transformer house. This house contains three 266-kilowatt air blast transformers, 6,600/3,300 volts, and three 500-kilowatt transformers of same type with blower equipments consisting of four motor-driven fans. From here the lines run into "A" and "B" compressor house and the power is distributed around the works.

The lines from Kingdom and Wadhams are connected to the bus-bars at central. The lines from Port Henry power house are connected to the bus-bars in "A" and "B" station. These two sets of buses are connected together so that any one of the plants may be operated on any of the feeder lines, or they may all be run in parallel. The voltage is maintained by means of a regulator on each generator. All of the power houses are connected by local and private telephones.

A large part of the load on the plants is used in the "A" and "B" compressor house, which furnishes the air for the Old Bed and Harmony mines. In this building are placed five

compressors with a total output of 10,000 cubic feet of free air per minute and a 300-horsepower hoist. The hoist is of the four-drum type and is driven by 300-horsepower electric motor.

The compressor installation comprises two two-stage, 1,200-cubic foot compressors, belted to 200-horsepower, 440-volt induction motors, one two-stage compressor of 2,550 cubic feet capacity, belted to a 300-horsepower, 3,300-volt synchronous motor, and two two-stage compressors, of 2,500 cubic feet capacity, belted to synchronous motors of the same size and type as those given above.

Formerly the total load was comprised of induction motors giving a low power factor and poor regulation. The synchronous motors mentioned above are operated with an input of 350 KVA and 80 per cent leading power factor, giving good regulation and a considerable increase in generating capacity.

Connecting Railroad and Docks.

The ore docks on Lake Champlain are about seven miles distant from the principal workings at Mineville, and are connected by the Lake Champlain & Moriah railroad, which was constructed in 1868 jointly by Witherbee, Sherman & Co. and the Port Henry Iron Ore Co. At the time, this was an ambitious bit of railroad construction, as the terminals have a difference in level of over 1,300 feet, necessitating a grade at places of as high as 4 per cent, though the average is only 3.1 per cent. Originally several switchbacks were necessary because of the mountainous character of the country, but in recent years a great deal of work has been done toward their elimination and a number of sharper curves have been modified. The road is standard gage, ballasted with tailings from the mines, and the tracks are laid with 90-pound sections.

The present equipment includes seven locomotives, two of which are of an extremely heavy Mogul type, weighing 318,000 pounds complete. These are equipped with small drivers for hill climbing and take the heavy grades without difficulty through the severe winter season, when locomotives equipped in the usual manner would scarcely be able to climb free. Wherever possible, the plan followed is to load foreign cars directly at the mine, this being the case when the product goes directly to the furnace by rail. For handling the ores and the concentrates between the mines and docks, however, the equipment now includes 25 pressed-steel gondolas with a capacity of 100,000 pounds each and 25 more of this type are now under construction. About 250 wooden jimmies, with an average capacity of eight tons, are in service, principally to handle the ore from the mines to the concentrating mills, but these are being replaced by steel cars as fast as they wear out. Another type of car employed is the 20-ton steel jimmie, the principal use of which is the transportation of ore which has to be rehandled at the Port Henry docks. In each of the smaller types of cars the brake facilities are unusual and a handlever dumps the car through the hopper bottom.

The docks at Port Henry occupy the lake front for about a mile and are divided between the two companies jointly owning the railroad. These docks have a storage capacity of some 250,000 tons, this large figure being necessary owing to the fact that water shipments are suspended during the winter. At present about three-fourths of all shipments are by rail, but with the completion of the 2,000-ton barge canal, it is estimated that a much larger percentage will be handled by water. It will be two, or possibly three years before this work is done, and at present canal boats of the usual size are the heaviest craft that can be handled.

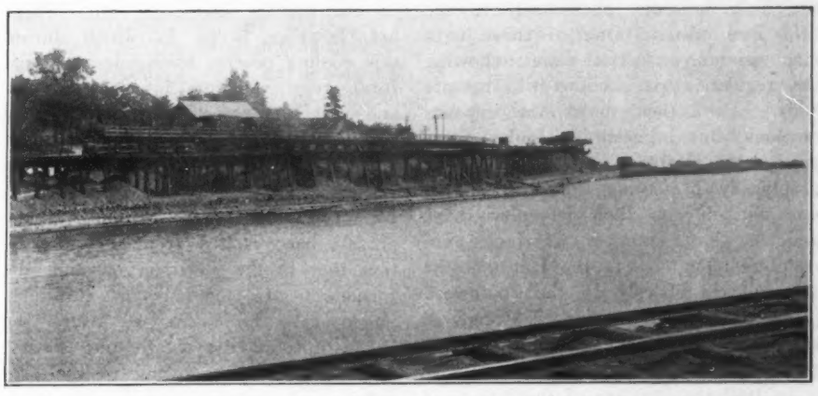
The docks are built with a series of overhead tracks and are so arranged as to permit either the transfer of foreign cars direct to the line of the Delaware & Hudson railroad, the storage of ore in pockets for easy reloading or the dumping of the ore into stock piles in various bins along the water front for later reshipment either by rail or water. Convenient weighing facilities are provided.

At Port Henry the road has well equipped shops, where practically all repair work is done. The sharp grades and arduous nature of the service render it imperative that the equipment be maintained in perfect condition, and it was with this object in view that the shops were installed. At Mineville, spur tracks connect the various workings, that to Smith shaft being of considerable length. Wherever possible at Mineville the gravity system of handling cars is employed.

Other Noteworthy Features.

The tailings resulting from the concentration of Harmony ore contain from 50 to 60 per cent silica, and have been found to be admirably suited for concrete work, yielding a product fully 25 per cent stronger than when sand is employed and reducing the proportion of cement to a minimum. A considerable market has been developed for these tailings, although the low price prevailing on concrete materials will not permit of long haulage. Mixed with as low as one-sixteenth part cement, this product is an excellent road material; both at Mineville and Port Henry this construction has been employed to a considerable extent with excellent results. Several miles of sidewalk in Port Henry have also been built of this material.

The Harmony tailings have been very generally employed at Mineville for building purposes. The office building of Witherbee, Sherman & Co. and the village school building, both large structures, are also of this material. The company has met the problem of providing homes for its workmen by constructing a large number of concrete houses at Mineville. For the most part, these are single houses, though a few provide accommodations for two families and some large tenement buildings have been put up to house the Italian laborers. These houses are of neat design and have been found to be much warmer than wooden structures. They are rented to the miners and other employes of the

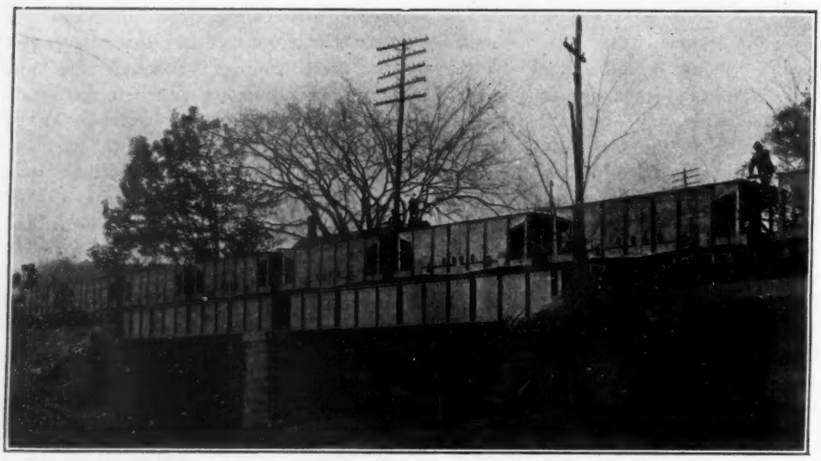


ORE DOCKS AND POCKETS AT PORT HENRY, ON LAKE CHAMPLAIN. VIEW LOOKING NORTH.

company at low figures and have done much to give the district stable labor conditions.

The office building at Mineville is a commodious structure and incorporates some unusual features, among them a basement room in which a complete testing laboratory has been installed. This contains miniature working models of the various types of crushers and separators in operation at the mills. Another interesting room in the office building is fitted up with cases in which the various mineral formations encountered in the working of the mines are exhibited. Among these is the gency cases are here offered, and the commodious auditorium is the scene of entertainments during the winter. A cooking school is operated for the benefit of the young women of Mineville and a band has been in existence among the company's employes for several years.

For the foregoing information, the writer wishes to acknowledge his indebtedness to the officials of Witherbee, Sherman & Co., Inc., at New York, Port Henry and Mineville, particularly to S. Norton, general manager, and S. Le Fevre, chief engineer, both at Mineville.



LAKE CHAMPLAIN & MORIAH RAILROAD, SHOWING TYPE OF STEEL CARS.

so-called "Big Diamond," which is an almost perfect crystal of magnetite of octahedron shape, the edges measuring considerably over 1 inch. In this same room are two graphical descriptions of the peculiar form which the ore body presents, particularly in the Old Bed mines. One of these is a map printed on glass plates, showing the regular cross sections of the ore body. The other shows the deposits on long rods inserted at regular intervals on a platform. The difficulty of graphically presenting these deposits is due not only to their irregular shape and the large number of faults encountered, but also to the fact that the vein pitches sharply to the southwest. The offices at Port Henry occupy a handsome old brick building adjacent to the docks.

In 1893 the families of the late Silas H. and Jonathan G. Witherbee erected Memorial Hall, a large structure of sandstone quarried in the vicinity. It contains an auditorium, reading room, recreation room and bath rooms, which are at the disposal of the company's employes. The building also affords living accommodations for a number of the younger men, hospital facilities for the treatment of emer-

A NEW STEEL TREATMENT.

In the manufacture of armor plates from special steels, the metal is usually allowed to cool after it has been rolled and forged, and before it is subjected to the subsequent operations of cementation, tempering, etc. There are, however, steels in which during this cooling process blow-holes or rents form, resulting from internal tensions, and with the object of avoiding these the process to be described has been devised and patented by Messrs. La Societe Schneider & Cie, of La Creusot (Saone-et-Loire), France. The process has resulted from the observation that in the steels in question the formation of blow-holes is inevitable unless care be taken to insure the exhaustion of the exothermic phenomena which occurs owing to the production of complex carbides on cooling.

The following are some explanations as regards these phenomena.*

If steel heated to a suitable temperature be allowed to cool, and if the curve of the cooling be plotted, an interruption in this cooling will be observed at a certain temperature. This interruption is explainable by a liberation of heat in the metal, and corresponds to an exothermic phenomenon (literally a phenomenon which liberates heat). The temperature at which this phenomenon commences will be referred to later as the critical point in the cooling.

When, on the other hand, the metal is heated, it is observed that at a certain temperature a phenomenon which is the inverse of the foregoing is produced, that is to say, an absorption of heat, and the temperature at which this phenomenon begins is called the critical point in the heating of the metal. For steels used for armor plates the temperature of the critical point in the heating is always much higher than the temperature of the critical point in the cooling.

It has been found from experiment that in these steels the critical point in heating varies slightly in accordance with their composition, but is always included between 650 and 720 degrees Cent., while the critical point in cooling varies between 250 and 350 degrees Cent.; the metal which gives the lowest point in heating likewise gives the lowest point in cooling, and the result is that the difference of temperatures at which these critical points occur varies between 650 degrees — 250 degrees = 400 degrees and 720 degrees — 350 degrees = 370 degrees.

The intensity of the exothermic phenomena and of the inverse phenomena, and the position of the critical points in the scale of temperatures vary largely with the circumstances, and particularly with the nature of the steel.

Having given these explanations, we will proceed to indicate the treatment necessary for preventing the formation of blow-holes.

The cooling of the metal is stopped for a suitable period according to circumstances at a temperature adjacent to that of the critical point in cooling, but slightly above it, or else heating is effected to a temperature suitably lower than the critical point in heating, or these two treatments are adopted in succession. There are circumstances in which the stoppage of the cooling may be carried to such a point that during a given time the temperature of the metal does not fall at all. After this intermediate operation, total cooling is effected, and this operation can then be carried out without inconvenience or risk, as the metal has assumed a final state of molecular equilibrium. This process can be adopted with a degree of

*A fuller explanation will be found in chapter II of Baron von Juptner's "La Siderologie."

utility which increases in proportion as the critical point in cooling the special metal is lower.

In practice the procedure may be as follows:

After being subjected to the operations of rolling and forging the metal is heated to an appropriately high temperature which in any event should be higher than the critical point in heating. It is then allowed to cool to a temperature higher by about 250 degrees than the critical point in cooling. At this moment, instead of allowing the metal to cool normally, its cooling is retarded as much as possible either by the juxtaposition of heat-retaining materials or by furnishing a supplementary quantity of heat.

In the case of thin plates the retardation of the cooling thus effected may be sufficient in certain cases. In the case of thick plates, it is advantageous either to replace the retardation of the cooling by an actual heating of the plates carried to a temperature lower than the critical temperature in heating, or to follow the retardation of the cooling by the re-heating already referred to. The highest temperature during this re-heating is much lower than that of the first heating, and sufficiently low to avoid the destruction of the part of the molecular transformations obtained during the first half of the treatment. This second heating is followed by a cooling which may be rapid or slow at will.

After these several treatments have been effected, the exothermic phenomena are exhausted, the molecular arrangements are complete, the absence of tensions is perfect and the facility of machining in a cold state is as great as possible having regard to the nature of the metal, and owing to this the steels are rendered capable of industrial utility.—*The Mechanical Engineer,* London.

COAL AND IRON MINES IN CHINA.

Consul Julean H. Arnold, of Amoy, reports that a native company at that port, capitalized at $800,000, is getting ready to operate coal and iron mines, which are said to be valuable, in the An Ch'i district, 100 miles from Amoy, for which it has held a concession for some years. The company, it is said, will need foreign capital and a foreign engineer to run the works, but as it will require some five months to complete its organization and draw up resolutions it will not be possible to ascertain its intentions in this regard until after that time.

PROGRESS IN ELECTRIC CURRENT DEVELOPMENT IN THE ARTIFICIAL LIGHTING FIELD.*

(Continued from last issue.)

In 1881 the Edison Illuminating Co. of New York was organized, which company immediately started to erect its first central station, namely, that in Pearl street near Fulton street. This station was started in 1882, and supplied during the first month 85 houses wired for 2,323 16-candle power incandescent lamps. From this pioneer installation the present system of the New York Edison Co., which is the largest electric lighting company in the world, has developed. This pioneer installation was operated on a two-wire system; the high cost of copper conductors suggested the use of the three-wire system, which was quickly adopted. Soon after the New York company was started, Edison illuminating companies in many of the large cities of this country and of Europe were likewise started, these companies all being licensed under the parent company known as the Edison Electric Light Co.

About 1885 the alternating current transformer was introduced. This made it possible to generate and distribute alternating current of high voltage, and by means of these transformers located on poles or on customers' premises, to reduce this high voltage to the voltage required by incandescent lamps connected in multiple. Systems were quickly developed consisting of alternating current generators producing generally 1,100 volts at a frequency of 133 cycles per second, which current was distributed to the transformers whereby the voltage was reduced to 55 or 110 volts for supplying incandescent lamps in multiple. The alternating current transformer system of distribution was pushed most actively by the Westinghouse Co., and this system immediately found extensive introduction in smaller cities and suburbs where the direct current system could not be economically operated because of the high cost of the copper required. With the introduction of the alternating current system a heated rivalry started between the advocates of the direct current system and the advocates of the alternating current system. However, soon each system found its own proper field of application, the low-tension, direct current system for isolated plants and for congested areas in large cities, and the alternating-current system for small towns and for outlying districts, and the two systems have retained these separate fields to the present day.

The incandescent lamp was primarily introduced to be used in multiple on constant potential circuits for indoor lighting, and this has remained its greatest field of application. From the early days to the present, incandescent lamps have, however, been used in series on constant-current circuits for street lighting where small light units were desirable, as for streets of villages and suburban towns, shaded parks, etc. Constant current for series incandescent lamps was originally obtained from constant potential dynamo machines by the use of some hand-regulating device arranged on the station switchboard. Since constant current transformers were introduced, in about 1902, these series incandescent systems have been most generally supplied from such transformers.

From the first installation up to about 1895, the Edison stations were equipped with direct current dynamos driven by steam engines. From the 125-horsepower "Jumbo" dynamo, of 1881, the direct current dynamo machine was developed into the multipolar form in sizes up to about 2,500-horsepower. About 1895 polyphase alternating currents came into use, and the rotary converter as a means of changing polyphase alternating current into direct current had also become a practical machine. This development made it possible to generate electric power as high voltage alternating current, transmit this for considerable distances and then convert into direct current. Since the end of the '90s, Edison companies in the large cities have quite generally substituted for the scattered direct current steam generating stations, rotary converter sub-stations, receiving their power from one main generating station in the form of 3-phase, 25-cycle, 6,600-volt, or 11,000 volt alternating current.

Alternating current series arc lamps are most generally supplied from constant current transformers. Direct current series arc lamps are still largely supplied from constant current dynamo machines, principally of the Brush type. About six years ago the mercury arc rectifier was developed by Dr. Peter Cooper Hewitt, by which it was made possible to change alternating current to direct current in a simple and efficient manner without moving machinery. This mercury arc rectifier, combined with the constant current transformer, makes it possible to obtain a constant direct current for operating direct current arc lamps in series, the power being supplied to the constant current transformer from constant potential alternating current generators and gen-

*Written for Fiftieth Anniversary Issue of American Gas Light Journal, July, 1909, by Albert F. Ganz, M. E., Professor Electrical Engineering, Stevens Institute of Technology.

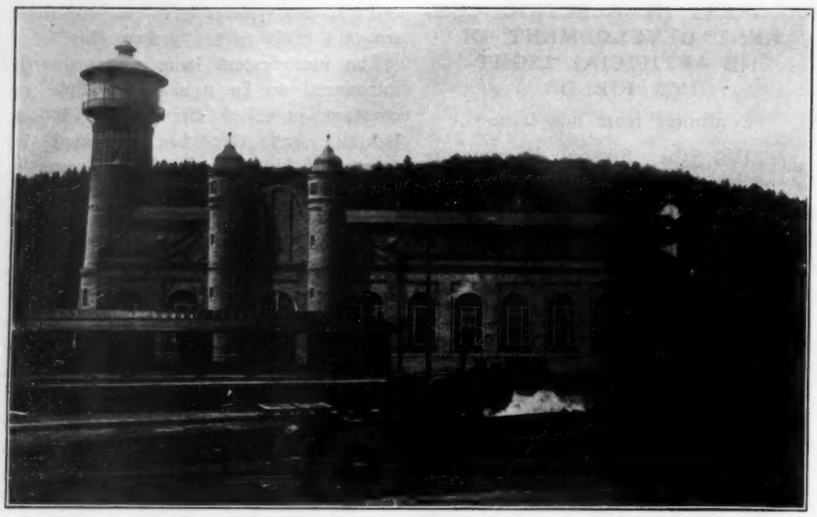


FIG. 1—SLAG-BRICK PLANT OF COLN-MUSENER BERGWERKS-ACTIEN-VEREIN AT CREUZTHAL, WESTFALIA, GERMANY, SHOWING MANNER IN WHICH SLAG IS RECEIVED FROM CAST-HOUSE.

erally at very high voltage. Constant direct current systems employing this arrangement of constant current transformer and mercury arc rectifier have come very largely into use during the last few years, and are taking the place of constant current dynamo machines.

Dynamo-electric machines have been developed from the Edison 125-horsepower "Jumbo" dynamo, of 1881, which was then considered "gigantic," to alternating current generators having normal ratings of 5,000, 10,000 and 14,000 kilowatts, with an overload capacity at least 50 per cent greater than normal rating. These generators produce generally 3-phase, 11,000-volt, alternating current; the usual frequency is 25 cycles per second, where the alternating current is to be used to drive motors or to supply rotary converters for conversion into direct current. Where the alternating current is to be used for lighting arc or incandescent lamps the usual frequency in America is 60 cycles per second. An idea of the enormous capacity of a 14,000-kilowatt dynamo machine, the largest so far built, may be gained by considering that this machine is capable of supplying continuously electric current to 560,000, 25-watt, 20-candle power tungsten lamps, giving an aggregate light equal to 11,200,000 candles. This practical subdivision of the electric light into over one-half a million units from a single dynamo machine is especially remarkable when it is considered that only 40 years ago a number of leading scientists, both in Europe and in America, positively stated that the subdivision of the electric light was a physical impossibility.

EUROPEAN TESTS OF AMERICAN BLAST FURNACE SLAG IN BRICK MANUFACTURE.

Experiments with American blast furnace slag for utilization in the manufacture of slag brick are being made by German holders of this process, which is now being employed upon a commercial basis by some European blast furnace interests. Satisfactory results have been obtained from the tests that have been completed during the past six months and some samples of brick from the American waste furnace product have been produced, but further investigation along this line is still under way. The slag which is being sent abroad for this purpose is being taken from one of the modern American blast furnace plants in the Pittsburg district. The Cöln-Müsener Bergwerks-Actien-Verein of Creuzthal in Westfalia, Germany, which is the owner of the brick-making process, is conducting the experiments at its works. This interest is now manufacturing the brick by this method at two plants, each of which has a capacity of about 100,000 bricks daily. This output would be represented by a greater American equivalent since the standard German brick is somewhat larger than that of this country. The slag for the two plants is taken from three blast furnaces which the company operates. An accompanying view is of one of these plants, the buildings of which are of this material. It shows the manner in which the slag is received into the grinding department of the works from the furnace cast house.

The general process of manufacturing the brick from the waste product of the blast furnace, first involves the grinding or granulating the slag as it comes from the stack. The fine powder thus obtained is rendered plastic by the application of water, after which the material is placed in a regular brick press and made into the desired shapes. Subsequently the bricks are put in large closed tanks into which are introduced blast furnace gases under pressure, this step emphasizing the self-contained nature of the operation. By absorbing the carbonic acid from the gas, a chemical composition is formed which gives the material the strength said to be equal to that of the average American clay brick. The manufacturing operation requires about 24 hours to complete.

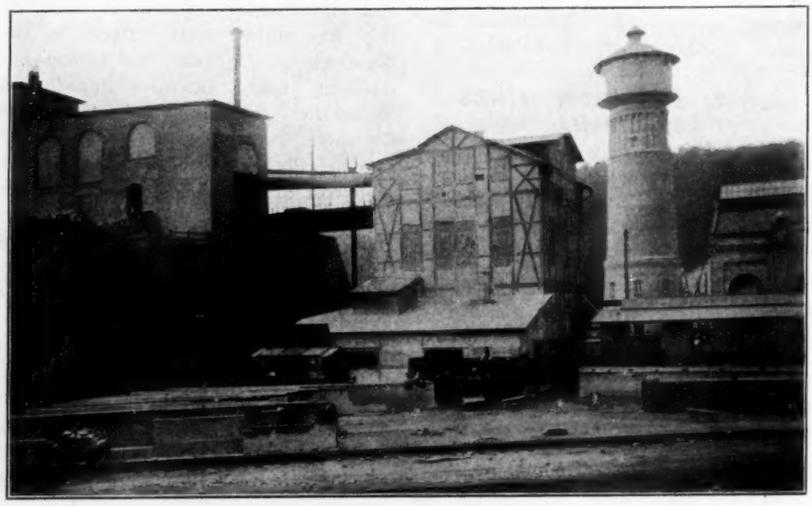


FIG. 2—POWER HOUSE OF COLN-MUSENER BERGWERKS-ACTIEN-VEREIN, BUILT OF FURNACE SLAG BRICK.

The material may be molded into any ordinary forms of terra cotta. Upon its being subjected to severe tests in laboratories, or under freezing atmospheric conditions, it has shown no deterioration. It is also highly refractory and in this respect, it is claimed it is equal to the burned clay brick or terra cotta.

The cost of manufacture is low since no heat is required and the material used is a waste product of the blast furnace. The process is especially applicable to isolated furnaces where the use of gas engines running on waste gases is prohibited.

Companies are being organized in Europe to manufacture the slag-brick under the process of the Cöln-Müsener Bergwerks-Actien-Verein and this activity may extend soon to this country. F. H. Kindl, consulting engineer, Bakewell Building, Pittsburg, is the representative of the German company which has also been introducing in the United States the Menne oxygen melting process, controlled by the same company.

ANOTHER ANCIENT HANGING ROCK CHARCOAL FURNACE

The issues of THE IRON TRADE REVIEW for Aug. 5 and 19, 1909, contain references to some ancient charcoal furnaces of the Hanging Rock region in Ohio, and we are now able to present some particulars of a still more ancient furnace than either of those hitherto described, and still active as late as 1907. In the Directory to the Iron and Steel Works of the United States for 1908, published by the American Iron and Steel Association, appears the following:

Center Furnace, The Superior Portland Cement Co., Superior P. O., Lawrence County. One stack 40 x 10½, built in 1837; open top; ore, native limestone, chiefly mined by the company; product, pig iron especially adapted for cylinders, pulleys, and all kinds of machinery where strength is required; annual capacity of 4,500 tons. Brand "Center." Charcoal pits with an annual capacity of 200,000 bushels are connected with the furnace; also a plant for the manufacture of cement from rock, with a daily capacity of 2,000 barrels. Justus Collins, President, and J. A. Latham, Secretary and Treasurer, Charlestown, W. Va.; M. L. Sternberger, Vice President, Jackson, Ohio; J. B. John, manager, Superior, Ohio. (Formerly operated by Mrs. Nannie H. Kelley; acquired by the present company on July 1, 1906.)

Center furnace, according to the dates in the ancient records of the business, was built in 1833 by William Carpenter, and in 1841 passed to the hands of R. B. Hamilton. In 1858 W. W. Johnson, as administrator for the estate of R. B. Hamilton, deceased, leased it to W. D. Kelley & Sons, and in 1867 W. D. Kelley bought the property outright. The furnace was managed by Lindsey Kelley until his death in 1902, and afterwards by his widow until the property was sold to the Superior Portland Cement Co., of Superior, O., in 1906. This is probably the only instance of the management of a blast furnace by a woman, and the old residents of Superior say that her supervision was most complete and that it was a common occurrence for her to don a leather jacket and divided skirt and take active charge of operations, which included mounting a horse astride and superintending the mining and transportation of the ore, which was brought by ox teams from the mines, or the production of the charcoal required in the operation of the furnace.

The stack is square and built of stone, with buckstays at about 5-foot intervals from the base to the top. The lining is of fire brick and the present lining has been in use for over 26 years, though a new hearth is built each year. A flue is built under the hearth to permit the passage of a current of air. The stack has a capacity of 12 tons per day. There is only one tuyere, 4 inches in diameter made of bronze and water-jacketed, and through which the hot blast passes into the furnace. The blast pressure is two and one-half to three pounds. Steam for the blowing engines is generated in two horizontal boilers at the top of the stack by waste heat from the furnace, which, from the boilers, passes into the heating chamber or stove, in which there is a series of tubes through which the air from the blowing engine is carried, then through a flue direct to the tuyeres. This system of hot blast is said to have been the subject of a patent issued to one, Simpson, in 1861.

The old blowing engine is worthy of notice, and is shown in Fig. 10. It is of a very old design and of horizontal type. The steam cylinder is about 12 inches in diameter, with a stroke of 5 feet. It will be noted that the air cylinders are driven from a jack shaft, which in turn is driven by gear from the engine crank shaft. The chests and ports are bolted to the cylinder barrel on both the steam and air cylinders. The valves of the latter are of the flap type. On the discharge ends of the air cylinders will be seen an air receiver, from which the air is led direct to the heating chamber. An extension of the slide valve stem operates the pumps which circulate the water through the tuyere, etc. The connecting rods are of wood, iron strapped.

Fig. 3 shows how the slag is hauled from the slag bed in front of the furnace by means of a chain wrapped on the drum of a bull wheel.

The roasting or calcining of the ore is done by first laying a course of cord wood on the ground, with spaces 6 to 9 inches between, and over this another cross course of plank or cord wood, as seen in Fig. 7. On this is spread a bed of ore to a depth of about 12 inches, then a layer of small charcoal, then another course of ore, and so on until a height of about five feet is reached. Fires are then started at the base and allowed to burn naturally. The ore contains 45 to 50 per cent iron, and charges consist of about 1,100 pounds of ore to 30 bushels of charcoal and 110 pounds of limestone.

The photos shown on the following pages are by courtesy of the Superior Portland Cement Co., the present owner of the furnace.

LARGE ELECTRIC DRIVEN MUNICIPAL PUMPS.

It is reported that the city of Toronto, Can., is soliciting proposals on two 1,500-horsepower induction motors, four 1,500-horsepower synchronous motors, four 500-horsepower synchronous motors, two 500-horsepower induction motors, two 300-horsepower induction motors, and two 225-horsepower synchronous motors, with direct connected turbine pumps in each, together with valves, piping, bedplates, couplings, etc. The total horsepower foots up 13,050, which will be recognized as probably the largest electric pumping installation so far attempted.

An Intelligence Bureau.—Edwin S. Cunningham, United States consul at Durban, Natal, Africa, is doing good work in providing a commercial intelligence bureau, which promises to do much to educate the merchants of Durban concerning products which America exports. Catalogs of exporters of iron and steel products will be carefully filed for permanent reference. THE IRON TRADE REVIEW and other publications are on file at the consular office.

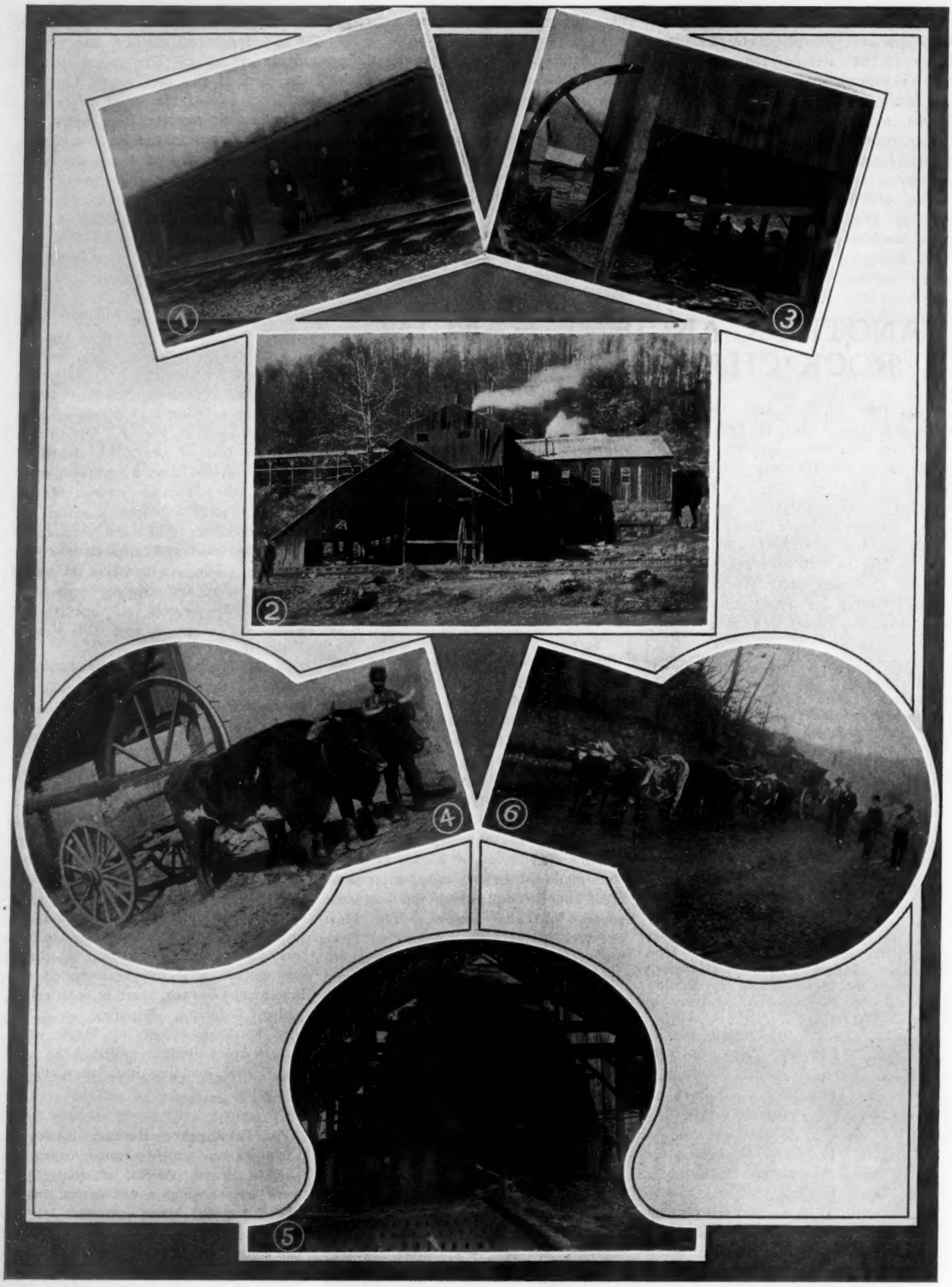


Fig. 1—Railroad Station.
Fig. 2—Exterior View of Center Furnace.
Fig. 3—Removing Slag From Slag Bed.
Fig. 4—Hauling Slag.
Fig. 5—Front of Furnace and Pig Bed.
Fig. 6—Oxen Hauling Charcoal.

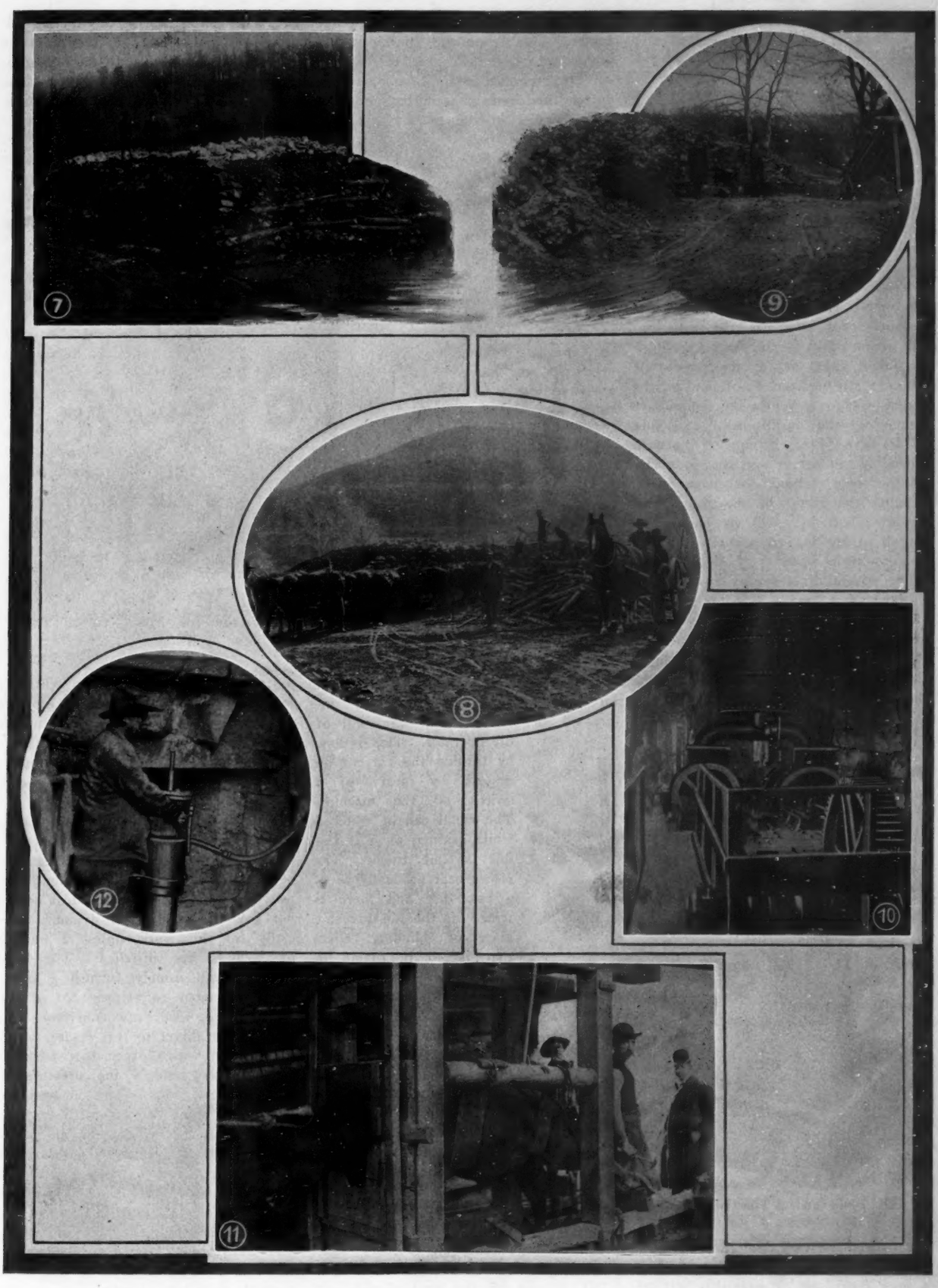


FIG. 7—BUILDING AN ORE KILN.

FIG. 9—ORE KILN.

FIG 8—UNLOADING ORE AT KILN.

FIG. 12—TUYERE.

FIG. 10—ENGINE ROOM.

FIG. 11—REPAIRING THE "LOCOMOTIVE."

ELECTRIC WELDING MACHINES.

The welding of metals is one of the arts that is as old as the use of iron, but until within a comparatively few years no decided improvement had been made over the primitive methods employed for ages. The leather aproned blacksmith, heating two pieces of iron in a forge, then hammering them together by main strength and a liberal sprinkling of welding compound, rarely understands the chemistry of the process that is going on before his eyes. The welding compound, consisting mainly of borax, melts and covers the surface of the metal, and the chemical action reduces the oxide scale to the liquid state and at the same time prevents further access of air to the heated surface. When the pieces are hammered, the burnt metal and flux is forced out, the reliability of the weld depending altogether on the judgment of the man behind the hammer in bringing the metal to the right temperature, and his skill in hammering out all of the burned particles of metal and oxide scale.

The advent of electricity has changed all this, as it has so many other manufacturing processes. A boy and a welding machine has revolutionized the old process, for he can weld more pieces in a day than a dozen skilled blacksmiths could possibly turn out.

The underlying principle of the electric welder is very simple, and is an adaptation of the well known fact that a poor conductor of electricity will offer so much resistance to the flow of current that it will heat. The degree of heat depends upon the amount of current and the resistance of the conductor. This is on the same principle as an incandescent lamp; the copper wires leading to the lamp are good conductors and remain cool, but the carbon filament of the lamp being a poor conductor and offering such a great resistance to the flow of current, reaches a state of incandescence.

FIG. 1—MACHINE FOR WELDING SMALL DRILLS.

The process of electric welding is especially applicable to the butt welding of metals having practically the same cross section at the weld. With the electric current, the heat can be applied at any point desired, and limiting it largely to this spot, as is done, all the energy is concentrated just where it is needed. The temperature can be maintained at any point desired for any length of time, and any degree of heat can be obtained up to the melting point of the metal, and can be increased or decreased at the will of the operator. This is done by turning the current on or off by means of a switch on the machine. The metal can be watched while heating, as it is visible at all times. The pieces heat gradually as in a coke fire and there is none of the disagreeable glare or blinding effect that is so noticeable in either the arc welding process or the acetylene process of welding, and no goggles or smoked glasses are used or required. As the heat is entirely between the vise jaws that hold the pieces to be welded, it is confined to the joint and there is no energy wasted in heating more material than is required to make the weld. No flux is required in making an ordinary weld, and there is no blistering or scaling.

It is one of the properties of an electric current to follow the path of least resistance; inversely, the greater resistance the more heat. When the ends of two pieces of metal are brought together, this is the point of greatest resistance and the abutting ends will instantly begin to heat. The hotter the metal becomes the greater is its resistance to the flow of current; consequently as the edges of the abutting ends heat, the current is forced into the adjacent cooler parts until there is a uniform heat throughout the entire mass, all of this being accomplished automatically.

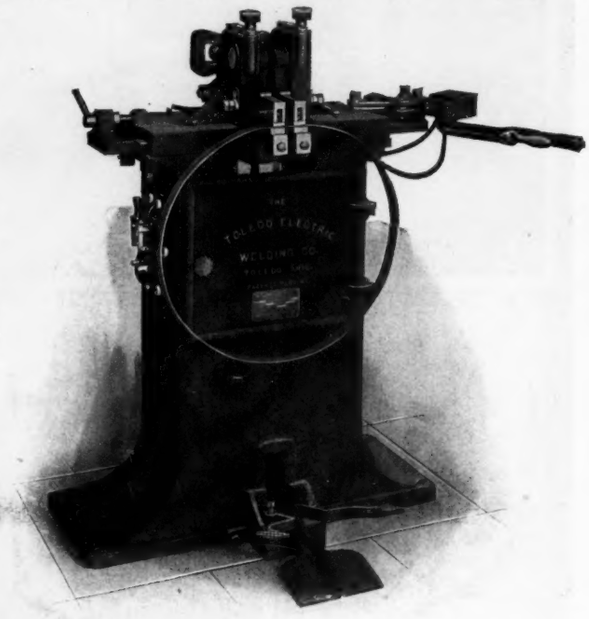


FIG. 2—UNIVERSAL WELDER FOR STOCK UP TO AND INCLUDING ¾-INCH.

For electric welding an alternating current is required. In nearly all cities and towns the current can be bought from the local lighting company at a price so low that it would not pay to invest in a dynamo especially for this work, unless a number of welders are installed. The local company will usually furnish a transformer adapted for either 220 or 440 volts. Two wires are run from this transformer direct to the welder, which is equipped with a special transformer that further reduces the pressure to four or five volts. This pressure is about the same as the ordinary dry battery used for door bells and there is absolutely no danger of a shock to the operator. The copper clamping jaws of a welder are similar to a pair of movable vise jaws and form the terminals of the secondary of a special transformer located in the welder.

When two pieces of iron are to be welded, they are clamped between the vise-like jaws which are set from one-half to two inches apart, according to the size of stock to be welded. The

ends of the metal to be welded touch each other. The current is turned on by means of a switch. In a few seconds the metal reaches a white heat and is in a partially molten state, when, by means of a lever, the ends of the metal are forced together while in this semi-fluid condition, thus making a homogeneous mass and a perfect weld. A projection or fin will be raised where the ends come together and this may be ground off or removed by a drop hammer or press. When a weld is properly made in a bar of iron or steel, it is as strong at the weld as at any other point. The heat is first developed in the interior of the metal and the interior being the hottest, the metal is welded at this point as perfectly as at the surface. When welding in a forge, the outer surface is heated first and very often the inner part is not as perfectly joined together as the surface, the result being an imperfect weld.

The Toledo Electric Welding Co., Toledo, have brought out a very complete line of welding machines for various purposes, a few of which are illustrated. Fig. 1 shows a special machine for welding small drills, one of which is shown in the machine. The operation of this machine is very simple, no expert operator is required, and work can be turned out very rapidly. The head on the left hand is a chucking jaw to hold the blade of the drill. Sockets are provided for the different sizes of drills and are held rigidly in the chuck jaws: the varying lengths of drills are taken care of by means of the adjusting bolt with a knurled head which is shown at the extreme left hand of the head. By this arrangement every drill of a certain size projects the same distance from the clamping jaws. The shanks of the drills are fastened in a chucking device shown at the right; the two heads are brought together by means of the large hand wheel and as the pieces to be welded are brought together they are absolutely in alignment. The automatic switch shown at the back of the machine is adjustable and can be set to open the circuit at any predetermined point. This enables the operator to set the machine to make the welds with the greatest degree of accuracy.

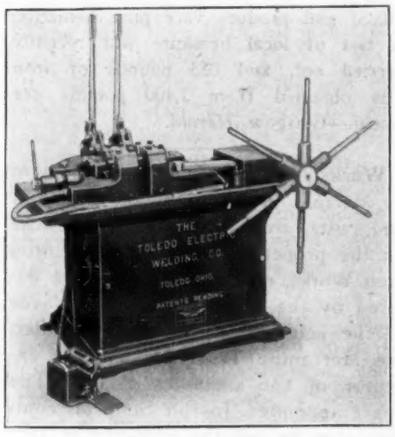


FIG. 3—MACHINE FOR WELDING ROUND STOCK.

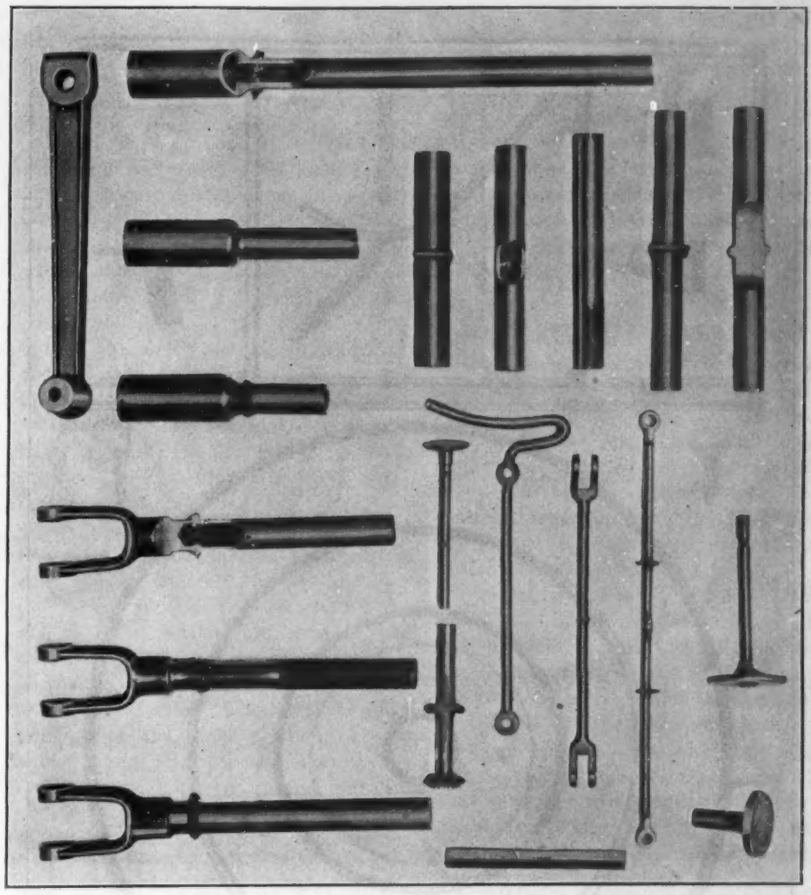


FIG. 4—SAMPLES OF ELECTRIC WELDING.

After the weld is made, the drill is automatically thrown out and the chucking jaws are in position ready to receive another drill.

Fig. 3 shows a larger machine designed for welding tubing steering rods for automobiles, etc., or solid stock up to and including 1⅛ inch round iron or steel. The stock is clamped in the copper jaws by means of the hand wheels shown on top of the machine. The right hand head moves back and forth in sliding ways and is actuated by the wheel shown at the right side of the machine. The current is turned on and off by means of the foot switch shown on the floor at the base of the machine. The clamping dies come far enough above the top of the table to allow bars or tubes of any length to be conveniently handled, and are welded, without in any way interfering with any of the working mechanism: at the same time the line of thrust is in the center of the jaws, thus insuring absolute alignment of parts when welded. The copper dies are water cooled in all of these machines.

As the illustrations show, the welders are solid and massive in design and well adapted for the use and abuse they are subjected to in service. They are usually placed in the hands of inexperienced operators, and are designed to stand the work imposed on them under the most exacting conditions.

Fig. 2 shows a universal welder designed to weld up to and including ¾-inch solid steel or iron. The clamping jaws are actuated by foot treadles and the current is turned on and off by means of a switch mounted on the lever handle shown at the right.

A few welded pieces are shown in the illustrations which will give some idea of the variety of work that can be done by this method.

Electric welding is, however, a

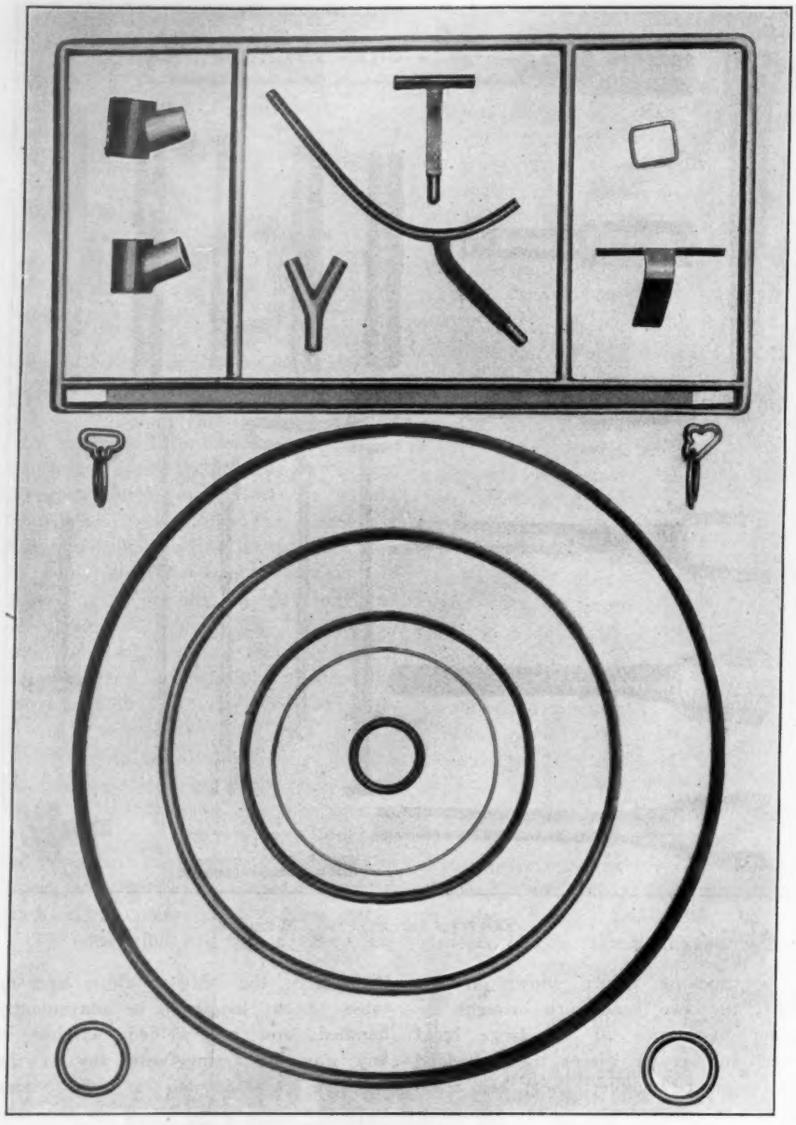


FIG. 5—MORE SAMPLES OF ELECTRIC WELDING.

proposition for the man with a great number of duplicate parts to weld or braze and is not adapted for the average blacksmith or repair man who has only a few pieces to weld per day. To give some idea of the cost of current for electric welding, and the time required, the following table has been prepared.

Round iron or steel.	Seconds to make a weld.	Cost of 1 000 welds at 1c per Kw.
¼	3	0.07
⅜	5	0.13
½	7	0.22
⅝	10	0.33
¾	13	0.50
1"	20	1.50

The price per 1,000 welds is based on current at 1c per kilowatt hour; if current costs 3c or 5c, the price given above must be multiplied by this higher rate.

WATER POWER OF CANADA.

According to a comprehensive estimate made by the engineer of the department of the interior the minimum flow development of all the water-powers of Canada is 25,682,907 horsepower, of which only 561,885 horsepower has as yet been developed. The secretary of the Canadian conservation commission estimates that the maintenance of one horsepower per annum from steam means a consumption of 21.9 tons of coal. The available water-powers of Canada therefore represent an energy that would require the consumption of 562,455,638 tons of coal per annum to produce. The largest amount of power is in Quebec, which has a minimum flow of 17,075,939. It is estimated that the construction of the Georgian bay ship canal would create additional water-powers amounting in the aggregate to 1,176,310 horsepower. We do not reckon much on water-power in this country—at present at any rate—but engineers will recognize the stupendous importance of the fact that Canada has 25,000,000 horsepower available for electrical development.—Glasgow *Herald.*

IRON ORE IN THE TRANSVAAL.

The experiments of the Transvaal government in the iron industry have not been carried any further than the smelting of scrap iron, and some dissatisfaction has been caused by the failure of the government so far to attempt seriously to prove the commercial value of the iron ore which is known to exist in the Pretoria and several other districts. The foundry foreman at the C. S. A. R. workshops, where native iron ore has been used with success in the manufacture of various articles, gives his opinion of the quality of Pretoria ore as follows:—"This ore is easi y fluxed, and good iron obtained free from sulphur and phosphorus. I consider this ore to be one of the best in the Transvaal. I know that it bears a bad name, but why? If there was more titaniferous pig iron used in the acid and basic process, there would be a much smaller percentage of piped ingots, as titaniferous pig iron desulphurizes the metal and makes a sound ingot."

The effect of titanium is to bind small quantities of nitrogen, to increase the fluidity of the metal, and to procure a finer and closer grain. The reaction has also the effect of reducing the sulphur contents as indicated by test results, which also show that traces of titanium can be found in the metal after treatment. The Pretoria ores are very free from sulphur and phosphorus, and are easily fluxed and produce very pure hematite. A test of local hematite was recently carried out, and 633 pounds of iron was obtained from 1,100 pounds ore tested.—Glasgow *Herald.*

Works to be Sold. — Judgement by default in the sum of $76,302.21 and costs, with an order to foreclose on the property owned by the Fulton Iron Works, of San Francisco, were entered by the Superior Court, in favor of the heirs of the late D. Chandler, the Mercantile Trust Co. and the executor of the Chandler estate. The court appointed Joseph Simpson commissioner to sell the property at auction at once and apply the proceeds to the payment of the judgment.

PITTSBURG'S ADVANTAGES

As a Manufacturing Center, as Stated by One Who Has Investigated.

With the growing importance of the western market for iron and steel products and the large new plant construction in Chicago and adjacent territory, which principal manufacturing interests have undertaken, the question has frequently been raised, has the Pittsburg district not reached the crest of its prosperity and is its future development not likely to be less extensive?

In this connection, it is interesting to note the causes that have influenced the action of manufacturers who are now erecting new plants in the Pittsburg district. A clear expression of present conditions in this respect is contained in the following interview given by President Ernest T. Weir of the Phillips Sheet & Tin Plate Co., which is now building a new tin plate works at the new town of Weirton, W. Va., located on the Ohio river opposite Steubenville, O.:

"The officers investigated cities and towns in the lake region, where several blast furnaces are being built and also in other localities out of the Pittsburg district," said Mr. Weir. "Finally they came back to the Pittsburg district, determined on the present site of Weirton ,and decided that, after all their investigation, the Pittsburg district was the only one affording the very best features for such a plant.

"We cannot get away from two very vital factors in the Pittsburg district. One is that fuel is cheaper and more convenient, and the other that skilled labor is better and more plentiful. We get the better class of workmen here because the best labor will not leave the Pittsburg district. They have been here for generations and refuse to change. For this reason we elected Weirton for the new plant which will start with eight hot mills and a tin house. This gives us the Pittsburg district advantages and workmen. Then, in addition, it gives us in a very few years the benefit of slackwater on the Ohio river into the coal fields, and as far as the Monongahela goes into West Virginia. In a few years more it will give us the benefit of the slack water down the Ohio to the great southwest, where the coming market for lighter forms of steel products will be the greatest for many years to come, greater even, than out in the west where developments have been going on for some time and where the market has become a most important factor in the steel trade."

Importance of Waterway.

President Weir said he believed that Pittsburg had not yet awakned to the vital necessity of agitating for a deep waterway to the Mississippi. "With that completed," he continued, "she would control the greatest market of this country. The quicker she becomes the head of a slackwater system to the southwest, the quicker will come better market conditions and a greater Pittsburg in the steel trade. Pittsburg can always look forward to being a center for the lighter forms of finished steel. The fact that some interests have selected lake ports for steel producing, merely indicates that the raw material market is likely to shift a little to meet the demands for the west. It does not mean that the raw material market of the west will command all production of heavy steel at the lakes, but will get sufficient to make it a factor. The further down you go in the steel products or, to put it more plainly, the lighter the forms of steel, the more fuel per ton of steel is demanded, and hence the manufacturers of the lighter forms find it better to stick close to the supplies of coal.

"The manufacture of sheet, tin plate, pipe, wire, rods, etc., in which fuel is a most important element, is bound to hold close to the sources of supply which will always be in Pittsburg. At Weirton there is plenty of good fuel to be had with water transportation. Raw material is also plentiful in the Pittsburg district and the shipping rates are all based on Pittsburg.

"The discussions that have been going on of late years of the tendency of the steel trade to migrate to the lakes and to the west are based on the fact that some new plants have been built there because of the increasing demand for iron and steel in that new country. It matters not that steel can be made cheaper in the Pittsburg district, the rule is the same, that wherever the demand is strongest, production will spring up to meet it. It is a common law. When the actual costs are measured, however, the Pittsburg district comes out ahead.

"It is not surprising, for instance, that Chicago should have some large steel plants to supply the western and northwestern trade, although they must haul their coal from Pittsburg in order to compete with the quality of steel made here. But the great west and northwest has grown to a point where the demand is settling down to a steady and gradual growth. In the southwest, which is a new and undeveloped country that is growing like a young giant, the next 20 years will see an enormous demand for all forms of steel products and Pittsburg should be in a position to command that market absolutely."

DODGE EMPLOYES CELEBRATE.

The Dodge Mutual Relief Association, a voluntary benefit society with a membership made up of 2,000 employes of the plant of the Dodge Mfg. Co., Mishawaka, Ind., recently celebrated its twentieth birthday. Since it was founded, July 31, 1889, the association has paid out over $15,000 to the members.

The management of the association is in the hands of workers in the Dodge plant. They divide the employes into two classes. Those earning over $6 a week pay weekly dues of 5 cents and get 80 cents a day in case of sickness or accident, while those earning less than $6 have the dues and benefit reduced by half. Membership fees are $1 in the first class and 50 cents in the second. Benefits are limited to 13 weeks in a year and death benefits of $50 or $25 are paid depending on the class to which the deceased belonged. When the fund on hand amounts to $500 assessments are suspended and resumed when they fall to $300.

Charles Endlich, secretary and treasurer of the company, has been treasurer of the association since it was formed.

Will Issue New Stock.—The Colonial Steel Co., Pittsburg, with works at Colonia, Pa., has completed arrangements for the issuance of $750,000 new stock, the proceeds of which will be devoted largely to plant improvements. The present outstanding capital of the company is $1,250,000, and it is proposed to have this stock take the place of common stock while the new issue will be preferred as to assets and dividends. It will carry a 7 per cent accumulative dividend and when the earnings have reached a point where the common can give the same rate of dividend, the two classes of stock will share equally in the distribution. The Colonial Steel Co. has recently been experimenting on a thorough scale with a welded steel and copper product, and it is reported to have been quite successful in this work.

Stocks Suffer Violent Declines

Renewed and violent declines throughout the greater part of the active list was the leading feature of the week in the New York stock market. The denial by Mr. Harriman of plans relative to the finances of the Union Pacific, caused heavy selling in that stock, and discouraging reports as to Mr. Harriman's health were another unfavorable influence.

Monday the market was feverish and irregular. Call and time loans were easier, while the general situation was favorable to higher prices, and the wireless reports as to Mr. Harriman were the principal unfavorable factor. Tuesday, stocks were less active. Union and Southern Pacific directors declared the usual dividends. Wheat declined in Chicago. Corn was firm on adverse crop reports. On Wednesday, Mr. Harriman's interview upon his return disappointed many dealers in Harriman securities, and they were unloaded rapidly, with large declines resulting in Union and Southern Pacific, New York Central and Reading. Corn declined on the breaking of the drouth in the west. Thursday, Union Pacific continued its downward course, touching 198, the general market was weak and the total sales reached 1,276,000 shares. On the Pittsburg market, Westinghouse Air Brake closed higher. Friday, sales in New York amounted to 1,171,000 shares, with the market nervous and fluctuating. Money continued easy and unchanged. Saturday, the lowest prices of the week were reached, but there was a slight reaction from the lowest before the end of the session.

Money on call was nominally 2 per cent at the close of the week, the week averaging about 2¼ per cent. Time money was easier at the close under very light demand. Bank clearings in the United States were estimated at $2,900,636,243, which was 13 per cent less than the week before, but $673,000,000, or 30 per cent, heavier than the corresponding week last year.

The actual report of clearing house banks showed surplus decreased $1,608,750; loans increased $1,651,000; deposits decreased $649,400; the ratio of reserve, 26.3, against 26.4 the week before. Trust companies and non-member banks showed an increase of loans and investments of $8,121,300; decrease of deposits of $4,708,700, and the percentage of reserve unchanged at 18.1. Failures for the week numbered 172, against 182 the week before, and 252 the corresponding week last year. Liabilities of commercial failures for August were $7,712,352, against $17,888,221 for the same period last year. The report of the American Railway Association on car surplus, shows that there are 157,415 cars still out of service, a decrease of 49,758, put in service between Aug. 4 and Aug. 18. The total number of shares sold during the week was 5,649,450, against 6,175,150 the week before and 3,537,964 the corresponding week last year. The value of bonds sold during the week amounted to $22,967,000, against $25,515,000 the week before, and $28,357,000 the corresponding week last year.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Aug. 28	Changes in week	Date 1909 Ann.	M't'g.	Stock Outstanding	Dividend Basis	Last Declared	Date Last Div. Pay.
Allis-Chalmers	15	— ½	Sept.	2	$19,820,000			
Allis-Chalmers, pr	32½	—3			16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	12⅞	— ⅜	Feb.	2	41,233,300			
American Can, pr	82½	—1			41,233,300	7 cum	1¾ Q.	July, 1909
Am. Car & Foundry	60⅞	—1	June	24	30,000,000		½ Q.	July, 1909
Am. Car & Fdy., pr	119	.....			30,000,000	7 n. c.	1¾ Q.	July, 1909
American Loc	56¾	—4	Oct.	19	25,000,000	5	1¼ Q.	Aug., 1908
American Loc, pr	110¾	— ¾			25,000,000	7 cum	1¾ Q.	July, 1909
American Ship	63	—2	Oct.	13	7,600,000	4	1 Q.	Sept., 1909
American Ship, pr	108	+2			7,900,000	7 cum	1¾ Q.	Oct., 1908
Am. Steel Foundries(new)	57	—2¾	Dec.	2	17,184,000		.....	.....
Barney & Smith	35	.....	June	1	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith, pr	85	.....			2,500,000	8 cum	2 Q.	June, 1908
Bethlehem Steel	32⅛	— ⅛	April	6	14,862,000		.....	.....
Bethlehem Steel, pr	63½	— ⅛			14,908 000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	43½	— ⅛	March	16	45,000,000*	3	1½ S. A.	Aug., 1909
Cambria Iron	40¾	— ¼			8,468,000*	4	2 S. A.	Sept., 1908
Chicago Pneumatic Tool	31¾	.....	Feb.	15	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	43½	—1½	Oct.	18	34,235,500		3½	April, 1902
Crucible Steel	15½	+ ¾	Oct.	20	24,578,400		.....	.....
Crucible Steel, pr	80	+1			24,436,000	7 cum	1 Q.	Mar., 1909
Empire Steel	10	.....	April	27	1,254,770		.....	.....
Empire Steel, pr	65	.....			2,500,000	6 cum	3 S. A.	July, 1909
Fay & Egan	90	.....	Feb.	18	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	110	.....			1,000,000	7 cum	1½ Q.	Aug., 1909
General Electric	166	—2½	May	11	65,178,800	8	2 Q.	July, 1909
Harbison-Walker	31	—1	Jan.	18	18,000,000		½	Oct., 1907
Harbison-Walker, pr	95	.....			9,690,000	6 cum	1½ Q.	April, 1909
International Pump	43½	+1¼	June	8	17,762,500		1	April, 1905
International Pump, pr	88½	+ ⅜			11,350,000	6 cum	1½ Q.	Aug., 1909
Lackawanna Steel	50¾	+1	March	10	34,971,400		.....	.....
Lake Sup. Corp	27¾	.....	Oct.	6	40,000,000		.....	.....
New York Air Brake	89¾	— ¼	June	17	8,012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	100	.....	Feb.	3	8,500,000	3	1½ Q.	Sept., 1909
Niles-Bement-Pond, pr	100	.....			2,000,000	6 cum	1½ Q.	Aug., 1909
Otis Elevator Co	60	.....	March	15	6,375,300		1½ S. A.	Oct., 1909
Otis Elevator Co., pr	101	+1			6,295,000	3 n. c.	1½ Q.	July, 1909
Pa. Steel	68	.....	May	10	10,750,000		.....	.....
Pa. Steel pr	116	—1			16,500,000	7 n. c.	3½ S. A.	May, 1909
Pittsburg Coal Co	21½	—1¼	March	9	28,104,600		.....	.....
Pittsburg Coal Co., pr	60	—1½			27,071,800	7 n. c.	1¾	April, 1905
Pressed Steel Car	49	—1⅞	Feb.	17	12,500,000		3	Aug., 1904
Pressed Steel Car, pr	103	—4			12,500,000	7 n. c.	1¾ Q.	Aug., 1909
Pullman	190½	—6½	Nov.	10	100,000,000	8	2 Q.	Aug., 1909
Railway Stl. Spring	48	—2¼	March	4	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring pr	107⅜	— ⅜			13,500,000	7 cum	1¾ Q.	July, 1909
Rep. Iron & Steel	36⅞	—1⅛	Oct.	20	27,191,000		.....	.....
Rep. Iron & Steel, pr	104	—2			20,416,900	7 cum	2 Q.†	Aug., 1909
Sloss-Sheffield	83⅛	—2⅛	March	10	10,000,000	5	1¼ Q.	Sept., 1909
Sloss-Sheffield, pr	119	.....			6,700,000	7 n. c.	1¾ Q.	July, 1909
U. S. Pipe & Fdy	31½	—1	June	23	12,500,000	2	½ Q.	Dec., 1907
U. S. Pipe & Fdy. pr	85	— ¾			12,500,000	7 n. c.	1¾ Q.	Sept., 1908
U. S. Steel	75⅜	—1	April	19	508,302,500	3 n. c.	¾ Q.	Sept., 1909
U. S. Steel, pr	124	—1			360.281,100	7 cum	1¾ Q.	Aug., 1909
U. S. Steel, 5s	114¾	+ ⅛			463,798,000	5	5 A.	.....
Va. Iron, Coal & Coke	65	— ½	Sept.	21	9,073,680		.....	.....
Westinghouse Elec	84½	—1¾	June	16	27,173,200	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	117	.....	Oct.	5	14,000,000*		2½ Q.	Aug., 1909

Par value of shares, $100, except those starred (*), $50.
†¼ ex. and 6¾ to apply on deferred dividends.

Copper Stocks.

New York.—Amalgamated copper closed last week 83¼, a decrease of 4¼.

Boston.—Butte Coaliton closed 25, a decrease of ½; Calumet & Arizona closed 105, no change; Calumet & Hecla closed 680, an increase of 5; North Butte Mining closed 60⅜, an increase of 1⅝; Quincy Mining closed 89, a decrease of 4.

Financial Notes.

The directors of the American Locomotive Co. have declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable Oct. 21. Books close Sept. 21 and reopen Oct. 22. The issue of $5,000,000 five per cent gold debenture bonds by this company was sold by Harvey Fisk & Sons, New York, at par.

The trustees for the Great Northern ore properties have declared a dividend of $1 a share, payable Sept. 15. Books close Sept. 1.

NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers—

The fo lowing manufacturing companies have filed articles of incorporation:

The Simplex Nut Lock Co., Scranton, Pa., $5,000 capital.

The Mallary Machinery Co., Macon, Ga., $35,000; by F. L. Mallary, W. H. Roper.

The Munich Machine Co., Munich, N. D., $6,000; by W L. Burdick, A. W. Huss, A. U. Peterson, all of Munich, N. D.

Stimple Mfg. Co., Geneva, Ill., manufacturing agricultural implements and specialties, $15,000; by Arthur E. Stimple.

The Ohio Steam Shovel & Dredge Co., Cincinnati, $50,000; Emil Jacobson, Frank Frommho'd, Herbert Mabus, Edward Uhl, Walter Petzhold.

The Metal Specialty Co., Cincinnati, $10,000; Joseph Smith, Bankamin I. Kaufman, Isaac Kaufman, Joseph Brauer, Stanley Klein.

The Hill-Tripp Co., Anderson, Ind., manufacture and sell pumps, $30,000; by A. E. Tripp, Hugh Hill, Forrest Hill, Horace C. Stilwell, Thomas M. Stilwell.

The Ohio State Boiler Co., Lorain, O., $25,000; to manufacture boilers invented by Messrs. Wurmser and Worden; by H. O. Wurmser, H. L. Worden and others.

The Erie Iron & Steel Co., Erie, Pa., $30,000; by I. H. Emerman, 121 West Thirteenth street, B. A. Zacks, Henry Zacks, J. H. Zacks, Erie, Pa., and B. Emerman, Cleveland, O.

The Standard Supplies, Ltd., of Ottawa, Can., $20,000; by Frederick W. Musgrove, Ernest A. E. Robinson, Richard J. Kennedy and others. Machinery and contractors' supplies.

The Rococo Boiler Co., Erie, Pa., $100,000; by C. F. Thayer, G. J. Schaal, F. B. Downing, B. A. Walker, J. N. Thayer, H. N. Thayer, all of Erie, Pa., and E. M. Fancher, Chicago, Ill.

Harry S. Houpt Mfg. Co., Manhattan, New York, $600,000; automobiles; by H. S. Houpt, Pelham, N. Y.; M. K. Harris, New York city, and G. Cheney, Brooklyn. The company is establishing a p'ant.

The Luce Mfg. Co., Dalton, Mass., manufacture and sale of machinery, $20,000; by president, Thomas C. Luce; treasurer, Frank W. Strong, both of Dalton; clerk, John W. Woodburn, Pittsfield, Mass.

The Tungstolier Co. of Canada, Ltd., Toronto, $40,000; to manufacture electrical appliances; by Carle V. Hennecke, Elroy J. Kulas and Frederick C. Maxheimer, Cleveland, O.; Edward Irving, Toronto.

The Hazard Engineering Co., Gates, Monroe county, N. Y., $100,000; to manufacture automobiles and marine gasoline engines; by E. C. Hazard, G. E. Hazard, W. J. Robinson, Rochester; and J. Bennett, Buffalo.

The Napier Importing Co., New York city, manufacture machinery and tools, $150,000; by W. H. Delaney, Abraham Kap'an, Elwood Rabenold, of New York city, and H. B. Andrews and R. Maverick, of San Antonio, Tex.

The Bois Sheet Metal Works, Yonkers, N. Y., manufacture cornices, skylights and ornamental sheet metal work, $20,000; by William D. Kelley, Fred Roffe, both of 45 East Forty-second street; N. Bois, 562 West Thirty-fourth street, New York city.

The Standard Tube & Metal Co., Newark, N. J., $50,000; sheet and metal tubes and metal novelties; by F. E. Seery, 625 North Third street, Newark, N. J.; P. H. Seery and I. R. Seery. The company has a plant near Bloomfield avenue, Newark, which is now being equipped with machinery.

New Construction:—

The Geneva Foundry & Machine Co., Elgin, Ill., expects to build an extension to its plant soon.

The Stickney Gas Engine Co., St. Paul, Minn., has taken out a permit to build a foundry to cost about $40,000.

The Mohawk Foundry Co., Schenectady, N. Y., has begun work on a new building for the manufacture of iron and steel utensils.

The Standard Boiler Plate Co., Youngstown, O., has decided to increase the size of its plant, and will put in additional machinery.

The Waukegan Brass Mfg. Co., Chicago, has plans for an addition one story, 50 x 150 feet, which will cost $8,000.

The Scullin-Gallagher Iron & Steel Co., St. Louis, Mo., is preparing to enlarge its plant by the addition of a one-story pattern shop to cost about $10,000.

The Progressive Metal & Refining Co., Milwaukee, Wis., has begun the erection of a steel and concrete building, 80 x 160 feet, which will cost about $15,000.

The Columbus Bolt Works is preparing to erect a new bui.ding near the penitentiary, in Columbus, O. The old buildings are being removed to make room for the new structure.

The Columbus Forge & Iron Co., manufacturer of drop forgings, is erecting a large plant for the manufacture of well-drilling machinery. The company is also erecting an anvil shop which will be in use within a short time.

The Malleable Iron Fittings Co., Branford, Conn., has let the contract for a foundry to be erected by the H. Wales Lines Co., of Meriden, Conn., at a cost of about $50,000. The foundry wi.l be 200 x 135 feet, and will be of brick and steel construction.

The Howard Safe & Vault Co., Atlanta, Ga., has increased its capital stock from $175,000 to $500,000. The company intends to build a plant in the outskirts of Atlanta, and will have the only plant for the manufacture of iron safes south of the Ohio river.

The Willard Machine & Tool Co., Covington, Ky., has secured a permit for the construction of a one-story brick building to cost $4,500. The company recently decided to move to Covington, and has been granted a five-year exemption from taxes by the city council.

The Gus Pech Foundry & Machinery Co., Lemars, Ia., advises that it is building an addition to its plant, 40 x 108 feet. The building is of concrete, with steel frame, including window seats, so as to make it completely fireproof. The company does not expect to add any new equipment before spring. The building will be occupied about Nov. 1, and it is expected that the output of the company will be about doubled.

The Pacific Car & Foundry Co., Portland, Ore., which was recently incorporated, has taken over the W. F. Holman Car Mfg. Co., of San Francisco, and expects to enlarge the plant there and to install a new plant at a cost of about $400,000 in Portland. The company is now looking for a site for its new works. The officers are M. J. Hynes, president of the National Bank of the Pacific, San Francisco; W. H. Judson, vice president; C. M. Greene, treasurer, and W. L. Holman, manager.

The Massillon Rolling Mill Co., Massillon, O., expects to begin an addition to its plant for the purpose of install-

ing five new mills, which will make accomodation for a large number of men in addition to its present force. Supt. W. H. Davy announces that the plant is now about 60 days behind its orders, and it is increasing business. The company intends to install an 1,800-horsepower engine with rope transmission, sufficient to run eight mills. The engine will supply greater power than is needed for immediate purposes, but it is being installed for the purpose of meeting future requirements.

General Industrial:

The York Mfg. Co., York City, Pa., has just completed a large machine shop.

The Wright Hinge & Lock Co., Greensboro, N. C., has increased its capital stock to $50,000.

The Pittsburg Steel Products Co., Pittsburg, has increased its capital stock from $60,000 to $1,000,000.

The Reading Iron Co., Reading, Pa., is considering the erection of a puddle mill on land adjoining its property on Oley street in Reading.

Edwin J. Blake, Hartford, Conn., has just completed an addition 90 x 100 feet to his foundry. The force of men at present employed will be increased to about 160.

The Brush Runabout Co., Detroit, has purchased 20 acres upon which it will build four buildings to accommodate its increasing trade. An architect is now at work upon the plans.

The George W. Parsons Co., Newton, Ia., has begun the manufacture of crucible steel at the plant which it is now building. The company manufactures ditching machines.

It is announced that the Franklin plant of the American Steel Foundries Co., Franklin, Pa., will resume operations at once. It is expected that the Sharon plant will be started later.

John Mohr & Sons, Chicago, recently completed and shipped to the Colorado Fuel & Iron Co., 15 65-ton hot-metal ladles and are working on plans for two 400-ton metal mixers for the Indiana Steel Co., at Gary, Ind.

The Burden Iron Co., Troy, N. Y., is rapidly increasing the amount of work done at its Troy plant. Three furnaces, a merchant mill and two horseshoe trains were recently started.

An addition, 90 x 100 feet, to the Edward J. Blake foundry, Hartford, Conn., is nearly completed. When the new plant is used the force employed by the concern will be increased from 80 to about 160 men.

The Decatur Furnace Co., Decatur, Ind., was recently placed in the hands of P. D. Myers, as receiver. He qualified with a bond of $30,000. The company was financially embarassed and plans for reorganization failed.

Henry W. Klare, manager of the Southwestern Bridge Co., Joplin, Mo., announces the intention of the company to move the works from Joplin. It is possible that the plant will be moved to Fort Smith.

Negotiations are in progress for the location of the Illinois Steel Consolidated Forged Car Wheel Co., at Kenosha, Wis. John H. Shirley, of Chicago, is trying to interest Kenosha people in the plant.

The first carload of pig iron made in the electric furnace at Pit River, Cal., was received at Redding for use in a local foundry. The pig iron was the first ever made in Shasta county, Cal.

The Zenith Furnace Co., Duluth, Minn., recently announced an increase of wages amounting to nearly 10 per cent. The increase restores wages to the level that prevailed before the depression.

The Wheeling Metal & Mfg. Co. is engaged in erecting temporary quarters to take the place of the buildings recently damaged by fire. They will be occupied until the new plant at Glendale is completed.

The Atlas Drop Forge Co., Lansing, Mich., which recently suffered considerable loss by fire, advises that its machinery was saved. A new building is being erected over the machinery and the company expects to be in full operation early in September.

President Thomas, of the Lehigh Valley Railroad Co., awarded contracts aggregating $1,000,000 for four-tracking to line between Easton and Slatington, to F. H. Clement & Co., and J. A. Kelly & Co., of Philadelphia. The work is to be completed in seven months.

The Pequonnock Foundry Co., Bridgeport, Conn., advises that its new foundry building is to be 75 by 130 feet. It is to be completed by Oct. 15, and the company expects to occupy it about Nov. 10. Two cupolas, one six and one three-ton capacity, will be installed. All of the equipment has been purchased.

The Tennessee Coal, Iron & Railroad Co. has recently recorded deeds in Birmingham, Ala., conveying to itself land valued at $225,000. The land was purchased from a large number of independent holders, and it is said that it will be used for building a dam in Village creek to provide for a water supply.

Announcement has been made by the Westinghouse Machine Co., of the transfer of the offices of its stoker department, from East Pittsburg to Attica, N. Y., where the company has recently completed its automatic stoker plant. The change will give additional room in Pittsburg for the extension of the machine department.

A company has been organized consisting of W. D. Park, Asbury Park, N. J., G. I. Stanford, Milford, Conn., F. M. Stephenson, Pittsburg., Pa., and L. C. Taylor, Cambridge, O., known as the Union Sheet & Tin Plate Co., which contemplates the operation of the plants of the old United Sheet & Tin Plate Co., at Marietta, Cambridge and other points.

The building that covered the puddling furnaces at the Brown-Bonnell plant of the Republic Iron & Steel Co., Youngstown, O., is being repaired and will be used as a twisting shed. The old twisting shed has been torn down to make room for the new combination 10 and 12-inch mill. The twisting shed will be used for making steel bars for reinforced concrete.

Michael Blake and A. Gordon Murray, receivers of the J. B. & J. M. Cornell Co., structural iron and steel manufacturers of New York city, have been given court authority to continue the business another 60 days. Before the expiration of that period it is believed that the reorganization plan on which the receivers and creditors are now working can be put into successful operation. The receivership has now been on about five months.

The American Locomotive Co. has authorized the issue of $5,000,000 five per cent gold debenture notes in order to reimburse its treasury for money spent on improvements and to provide additional working capital. This is the second large note issue which the company has made in the last few years, the first having been $5,000,000 in October, 1906. In explanation of the present issue the company states that in order to take advantage of the low prices of materials then prevailing, it undertook extensive improvements some time ago, while the shops were not in full operation, in the belief that future prosperity would warrant such expenditure. The improvements so made cost the company about $3,000,000.

Fires:—

The machine shops and repair works of the Rogers & d'Arteney Mfg. Co. plant, Sacramento, Cal., were visited by fire Aug. 19, and a heavy loss was sustained. It is only about six months ago that the company was burned out of another plant.